THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[Registered as a Newspaper.]

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GAS PURIFICATION
BY
OXIDE OF IRON.

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These Paints are now used in over 200 Country Gas-Works, and by all the London Gas Companies, on Gas-holders, Scrubbers, Purifiers, &c. Also used by the Admiralty, War Office, Railway Companies, Founders, &c. They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations; do not crack, blister, or flake off; will cover tar effectually.
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CONTRACTOR FOR
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Gas, Water, & Sanitary Purposes,
AND MANUFACTURER OF
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FOR
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JOSEPH COWEN and CO.,
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J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.
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Established at the commencement of Gas Lighting,
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Established 1830.

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TELESCOPIC & SINGLE GASHOLDERS,
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And Gas Apparatus of every Description.
Marine, Tubular, Cornish, Plain, Furnace, Saddle, and Range Boilers.
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Roofs, Girders, and Bridges, and General Smith's Work.
London Offices: 97, CANNON STREET—
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THE
"OTTO" GAS-ENGINE.
See Page 262.

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NITSHILL COMPANY'S
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CANNEL COAL.
AGENT:
JAMES M'KELVIE,
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GEORGE GLOVER AND CO.,
HAVE REMOVED TO MORE EXTENSIVE PREMISES,
RANELAGH WORKS, ROYAL AVENUE, CHELSEA, LONDON, S.W.

The want of gaslight, caused by the freezing of Wet Meters, is a very general source of complaint, and it is acknowledged that all attempts to remedy the evil have proved futile.

The want of gaslight during the dark, foggy weather of mid-winter, when gas is most needful, is a source of great loss both to Gas Companies and the public. The convenience and economy of gaslight is so great, compared with any other artificial light; that there is no val'd ground for believing that it can be supplanted, and, until coal becomes many times dearer than at present, it must remain the cheapest and most convenient source of light and heat. It is especially to be regretted, when Gas Companies are making every exertion to remove all just grounds of complaint, and, as far as possible, to consult the public convenience, that the annoyance caused by smoky and unsteady flames, or the total extinction of the lights, consequent on the freezing of wet meters, should induce the public to lend a ready ear to the fallacy of the electric light as a substitute for gas.

The destructive influence of the expansive force of water while freezing is familiarly known in the bursting of water-pipes during frost; but the injury to Wet Gas-Meters, although quite as real, being internal, is not so apparent. The internal parts of Meters which have been frozen are warped or ruptured, and they frequently receive further injury by the hasty and unskilful method of thawing them, which often melts the solder as well as the ice, unfastening the bearings or other parts of the Meter, thus admitting of gas passing unregistered. Meters, once frozen, should be thoroughly repaired, and, as soon as convenient, replaced by **properly made Dry Meters** which register correctly, and with the action of which the most intense frost does not interfere.

Of course water in Dry Meters or watches will freeze, but its accidental presence in either is very rare, and there is no excuse for its being in them. More than one parent has been startled by finding his little hopeful experimenting with his watch in the wash-hand basin, and more than one stupid person has been found pouring water into a Dry Meter. Water may also get into Dry Meters by placing them below the level of the main, and connecting the service pipe at the lower part of the main, allowing water to flow into the Meter. Another means of getting water into Dry Meters is by foolishly placing them in connection with Wet Meters, the vapour from which condenses in the Dry Meters. Some water may also find its way into Dry Meters when they have been put in the place of Wet Meters, before clearing the internal pipes and fittings from water that had been deposited in them by evaporation from the Wet Meters.

The presence of water in Dry Meters is so rare and exceptional that it is properly ignored. Water is a necessity in the Wet Meter; but is incompatible with the Dry Meter. No Gas Company or Consumer suffers loss or inconvenience from frozen water in Dry Meters; but it cannot be ignored that many Companies and thousands of Consumers have suffered, and are suffering, serious loss and inconvenience from the freezing of Wet Meters, and some few Companies are suffering from the use of so-called Self-Regulating Meters, through which all the gas can be got unregistered, by inclining the Meter forward either accidentally or with the intention to defraud—a subject deserving the serious attention of such Companies.

LAMBERT BROTHERS, WALSALL.

ALPHA TUBE & FITTING WORKS

Manufacturers of **W. J. WARNER'S PATENT MARKET GAS STAND-PIPE.**

Now ready, GAS CHANDELIER BOOK (Reduced Prices), 7s. 6d.

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GAS ENGINEERS, IRONFOUNDERS, AND CONTRACTORS,

ROSE MOUNT IRON-WORKS, ELLAND, YORKSHIRE.

MANUFACTURERS OF EVERY DESCRIPTION OF

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IMPROVED CONSUMERS WET GAS-METERS

IN CAST-IRON CASES,

THE UNVARYING WATER-LINE GAS-METER,

AND

IMPROVED DRY GAS-METERS;

STATION-METERS OF ALL SIZES, with PLANED JOINTS;

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And all kinds of Experimental Gas Apparatus.

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Sixteen recently erected at Beckton, applied to Covers 30 feet square.

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IN SUCCESSFUL OPERATION AT THE NEW WORKS OF THE NEWCASTLE AND GATESHEAD GAS COMPANY.

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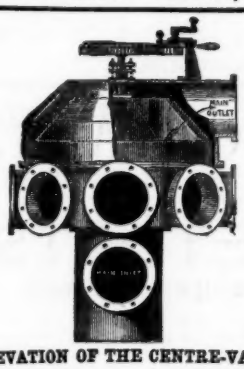
C. & W. WALKERS'
PATENT CENTRE-VALVES.



ELEVATION OF THE CENTRE-VALVE.

PLAN OF THE VALVE.

PLAN OF THE BODY.

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers on the system of three in action, and one out of action. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level; the Valve and all connexions being beneath the floor, out of the way of working. A considerable improvement and saving is effected in the cost of the connecting-pipes.

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And every description of Gas Machinery.

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WEST'S GAS IMPROVEMENT COMPANY,

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ARE NOW PREPARED TO SUPPLY AND ERECT THEIR PATENTED MACHINERY FOR

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And to enter into arrangements with GAS COMPANIES for its use upon moderate terms of Royalty.

The Patented Machinery has secured the approbation of all Engineers who have visited the MAIDSTONE GAS-WORKS, *where it is in full operation, and may be inspected at any time on application to the Manager.*

The advantages attending its use are—

INCREASED VOLUME OF GAS PER TON.—INCREASED YIELD PER RETORT.—INCREASED BULK OF COKE FOR SALE.—REDUCTION IN LABOUR AND LESS DEPENDENCE ON SKILLED STOKERS.

A Pamphlet containing a description of the Machinery, and Copies of Reports on the working of the same, &c., will be forwarded on application to the MANAGING DIRECTOR, Maidstone. Communications may also be addressed to the Consulting Engineer, R. P. SPICE, Esq., M. Inst. C.E., 21, Parliament Street, London, S.W., or to the Engineer and Analyst, F. W. HARTLEY, Esq., A. Inst. C.E., 55, Millbank Street, London, S.W.

EDWARD COCKEY & SONS,

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FOR PURIFIERS, GASHOLDERS, BYE-PASS, AND OTHER ARRANGEMENTS REQUIRING VALVES IN GAS-WORKS.

The Faced Valves, as made by the Patentees, continue to give great satisfaction, and they are being used extensively by many of the best gas engineers of the day.

They are more easily repaired than any other kind of Valve in use, and can be re-ground in a few hours without removal, and made perfectly gas-tight.

References can be given to many Engineers of high standing, who will testify as to the favour in which they are held.

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WARNER & COWAN'S PATENT SELF-REGULATING GAS-METERS;

ROUND STATION-METERS,

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SQUARE STATION-METERS,

WITH PLANED JOINTS.

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Home and Foreign Orders promptly attended to.

All Sizes of CONSUMERS METERS, STATION-METERS, and GOVERNORS generally in Stock.

Orders almost invariably despatched on the day of receipt.

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WOOD PURIFIER SIEVES,

Which have now been used for fifteen years, and their advantages and durability fully established. They are made entirely by steam machinery in very large quantities at the most moderate cost.

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GAS-RETORTS, GLASS-HOUSE FURNACE,
BLAST-FURNACE, TANK BRICKS, LUMPS, TILES,
And Every Description of Best Fire-Bricks.

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Plans and Estimates furnished; Gas-Works, Apparatus, Pipes, Machinery, Fire Goods, &c., supplied, or Attested and Shipped for Exportation.

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MR. ROMANS has for upwards of 30 years been practically engaged in the Manufacture of Gas, and has, by extensive experiments, ascertained that by JUDICIOUS INTERMIXTURE of the lighter with the heavier gases, much of the rich Hydrocarbons CAN BE SAVED, which otherwise ARE LOST, during the process of manufacture. He is therefore enabled to give advice to those who favour him with their orders for Cannel, as to the class which will secure for their standard of illuminating power the HIGHEST ADVANTAGEOUS RESULTS.

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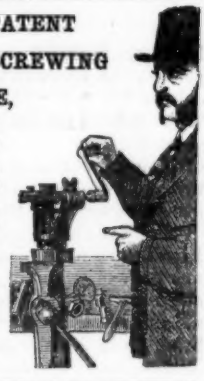
PORTABLE PIPE SCREWING

MACHINE,



For 1 in., 1¼ in., 1½ in., and 2 in. Gas Threads, complete £7 10s.

In use at the chief gas-works, and giving great a tisfaction.

For other useful goods, see Bailey's "Illustrated Inventions," post free 3s. 6d.; gratis to ledger customers.

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The only Gold Medal awarded for "Apparatus and Processes for Heating and Lighting" by the Imperial Commissioners

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The following Medals were also awarded at Paris, 1878:—

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Ornamental, Taper, and Cased Tubes; Tin Tubes;

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REGISTERED TRADE MARK:

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THE

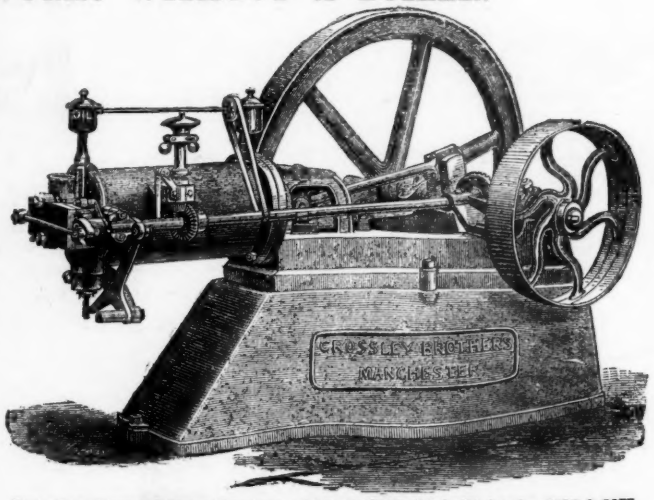
New "OTTO" Silent Gas-Engine.

AN ENGINE WHICH WORKS WITHOUT A BOILER.

The principle of combustion in this Gas-Engine is ENTIRELY NEW. In it an explosion does not take place in the ordinary meaning of the term. A small part only of the charge is combustible, which on ignition serves to expand the remainder, thus avoiding shock and effecting great economy. The Engine is also alone in the peculiarity of igniting its charge at the *beginning* of the stroke, leaving the whole of the stroke for effecting expansion of the gases, instead of merely a fraction as in obsolete constructions.

This Engine has a SMALLER NUMBER of MOVING PARTS than any other Gas-Engine; or, indeed, than many steam-engines. It is almost as silent as a steam-engine, works with the same smoothness and regularity of speed, and has the immense additional advantages of always being ready to start at full power at once on the gas being lighted; and, by dispensing with the boiler, of avoiding the danger of explosion, increased rates for insurance, expensive attendance, and all the annoyance which the use of a boiler entails.

Where work is intermittent, trouble with a small steam-engine and boiler is at its maximum, but at its minimum with a Gas-Engine.



Cut of 3½ Horse-Power Engine. Otto & Crossley's Patents, 1876 & 1877.

Sizes at present offered . . . . 1, 2, 3½, and 8 Horse-power nominal.
Being equal to about . . . . 1½, 2½, 4, and 12 Horse-power maximum.

Cost of Gas, One Penny per hour per indicated Horse-power, at 4s. per 1000 cubic feet.

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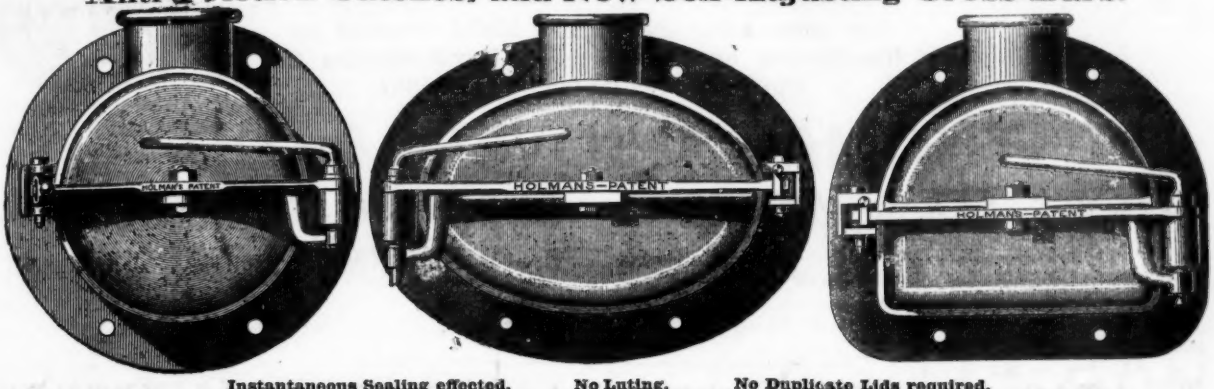
(LATE OF 10, LAURENCE POUNTNEY LANE.)

SOLE MAKERS OF MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH HOLMAN'S PATENT ECCENTRIC FASTENINGS,

Anti-Friction Catches, and New Self-Adjusting Cross-Bars.



Instantaneous Sealing effected. No Luting. No Duplicate Lids required.

Holman's New Self-Sustaining Cross-Bar ensures freedom of Joint, and maintains parallel position of the Lids.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested, being now in use in nearly all the principal Gas-Works in London and the Provinces.

T. B. and H. are now making the "Morton's Self-Sealing Lid" of the SAME FORM OR SECTION AS THE RETORT (see Illustrations above), as well as bringing the Mouthpiece from the D or Oval at back to Circular in front, as heretofore.

D and Oval Morton's Lids are working satisfactorily both in this country, on the Continent, and in the United States of America. Among others they have been adopted by the following Gas-Works:—

The Gaslight Company's Works, Fulham; Ditto, Bromley-by-Bow; Ditto, King's Cross; Ditto, Shoreditch.
And also in the Gas-Works at Richmond, Maidstone, Gloucester, Glasgow, Portsea, Roubaix (France), The Hague (Holland

HUNT'S PATENT EQUILIBRIUM GAS-GOVERNOR.

In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown in the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide-Valve direct in the main; and the holder can be placed at an convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.

These Governors have been adopted by many leading Gas Companies, among whom are the following:—

The Gaslight and Coke Co. (9), The London Gas Co. (3), and at Abergavenny, Arundel, Birmingham, Cannes (France), Devonport, Dursley, Exeter, Guernsey, Halesowen, Mentone (France), Monmouth, Newcastle-on-Tyne, Oxford, Plymouth, Rochdale, Windsor, &c.

TESTIMONIAL.

The Gaslight and Coke Company,
9, Water Street, New Bridge Street,
Blackfriars, E.C., Feb. 27, 1878.

MESSRS. TANGYE BROTHERS AND HOLMAN.

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Yours truly,
(Signed) JOHN JOHNSON.

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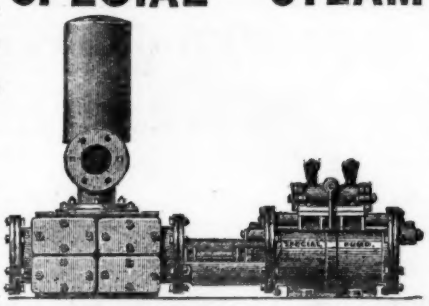
3	1½	9	450	£16
4	2	9	815	18
5*	2½	12	1,250*	20
5*	3	12	1,830*	22 10
4	4	12	3,250	25
6*	4	12	3,250*	30
5	5	12	5,070	32 10
7*	5	12	5,070*	40
6	6	12	7,330	40
8*	6	12	7,330*	50
7	7	12	9,750	50
10*	7	12	9,750*	65



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Are upheld for five years without charge.

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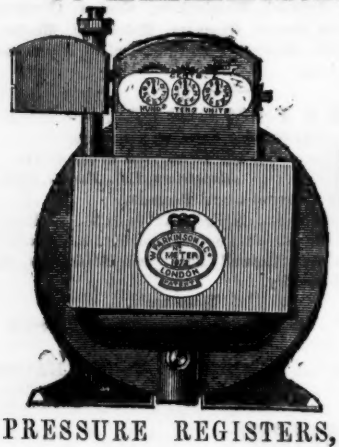

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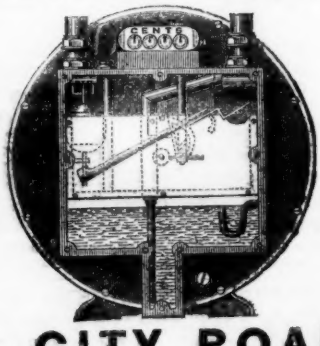

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W. PARKINSON and CO. have made arrangements for the manufacture of these Meters, both in tin and cast-iron cases, and for the alteration of old ones to this principle, which is confidently recommended as possessing every quality that can be desired by Gas Companies, Corporations, or Private Consumers.

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THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, FEBRUARY 25, 1879.

Circular to Gas Companies.

Both the Bills in Parliament promoted to obtain power to supply the electric light exclusively have now been withdrawn, and hence our correspondent, Mr. W. Livesey, opines that, in the several Gas Bills presented this session, all the sections relating to the light will be struck out. We confess that we do not exactly see the *sequitur*, but our friend is so experienced in parliamentary matters, that we hesitate to call his judgment in question. The sections appear to us quite harmless. They are simply to give Gas Companies and Corporations power to supply the light if they should think it advantageous to embark in the business. Earl Redesdale and Mr. Raikes are, no doubt, cogitating over the matter, and we shall soon learn to what extent they intend to interfere. They may possibly deem it advisable to limit, at all events for the time, the amount of capital to be expended on electric lighting plant, for the interest on it would certainly have to be paid out of gas profits. Further than this we do not think interference is necessary. Unlikely as it would seem to-day, the electric light may become a thing of importance, and there can be no reason why a Gas Company should be deprived of the chance of obtaining a share of the profits to be earned by its supply.

If there remain in any minds expectations that Mr. Edison will revolutionize the world of artificial lighting, they must, we think, be effectually dispelled by the account we published of his French patent in our last, supplemented by a description of his lamp, which we give in another column to-day. Mr. Edison's inventions lack the first essential of success—simplicity. They are complicated almost beyond description, and the use of them, it appears to us, would necessitate the constant employment of highly skilled mechanics. We consider Mr. Edison out of the field, and wait very patiently to learn what his next invention may be like.

Sir John Lubbock, yesterday week, put a very silly question to the Chancellor of the Exchequer. As a matter of fact, it was put for him, but Sir John placed it on the paper. It was whether the Government proposed any general legislation with regard to the electric light. The question was, of course, answered in the negative. It will be time enough for general legislation when the art of electric lighting has advanced beyond the experimental stage in which it now remains, and where it seems likely to continue. The first special Gas Act was passed in 1809; but it was not until 1847 that the first general measure—the Gas-Works Clauses Act of that year—was passed. It will, we expect, be more than thirty-eight years before any general legislation will be required in relation to the electric light.

The half-yearly meeting of the Liverpool United Gaslight Company was held on the 18th inst., when, as usual, dividends at the maximum rates were declared. It is satisfactory to know that the shares of this Company—the second largest in the kingdom—did not fall to the extent to which those of some other Companies did. The Liverpool Company hold a very prominent place among English gas undertakings, and, even in so speculative a place as Liverpool, the selling price of their shares undergoes but little variation. We are happy to learn that the long dispute between the Mersey Docks Board and the Company, respecting the destruction of the landing-stage, has been amicably settled; but £87,500, if we understand the matter rightly, is a long price to pay for the stupidity of a man who had not the presence of mind to dip his jacket into a pail of water and put it over the flaming jet to which he had set light. We have, however, to take a British workman as we find him, and Heaven help the employer who leaves him to his own devices when any important work is being done. The Liverpool Company are now safe from the consequences of accidents of this kind; but what would the results be to the Fitting Company, if an accident should happen through the stupidity or carelessness of one of their *employés?* After all, we are inclined to think that Gas Companies had better leave the fitting business alone, if they cannot afford to give the most efficient and responsible supervision over the men they employ. It is satisfactory to know that the Auditor appointed by the Recorder could find no fault with the accounts of the Company, except that certain small sums had been charged to the revenue which ought to have gone to the capital account. Every one will see that this practice, if worked out, would tend to the benefit of the consumer; but Mr. M'Quie does not seem to look at it in this light. His report furnishes nothing that can be considered to impeach the accuracy of the Company's accounts. As a matter of course, the Chairman must make some allusion to the electric light and the recent "scare." As we have said, the shares of the Company did go down in value, but not so far as those of some of the Metropolitan Companies. The result of the "scare" in Liverpool appears to be this, that sensible Shareholders increased their holdings, and a number of Proprietors of substantial means are added to the roll. A very good answer was made by the Deputy-Chairman to the charges of fraud for an insufficient supply of gas to the public lamps. It seems the Company contract to supply four feet of gas per hour to each burner; but the Corporation Engineer, going about the borough, and, no doubt, picking out small-flame lamps, arrived at the conclusion that only three and a half feet were furnished by the Company. The matter could not be allowed to rest there, so the Engineer of the Company and the Officer of the Corporation made together several more extensive tests, and in all cases found that the amount of gas consumed in the lamps was in excess of the quantity contracted for. This, we believe, will be found to be the result whenever complaints arise; and unless regulators are constantly looked after, some lamps will consume less, and some more than the quantity agreed upon.

There is no doubt that the electric light has roused gas manufacturers. Two more Corporations have resolved to hold "exhibitions of stoves, engines, and gas appliances in general." Care must be taken to arrange the dates of these exhibitions, so that the two may not collide, for the same exhibitors are sure to show at the two displays. We might almost express pity for the manufacturers, who have to hawk their wares about the country at the invitation of Gas Companies and Corporations; but we believe that, in the long run, it will pay them well; as it

certainly will the Gas Companies and Corporate proprietors of gas-works. The earlier display is to be held at Halifax, about the first week in April; and the second at Leeds, on the 16th of April. We have no doubt that a good collection of appliances will be brought together, and that the intelligent sight-seers will carry home with them a fund of instruction, which will tend greatly to increase the consumption of gas in these towns. All that Mr. Woodall has prophesied may not be exactly realized; but we still believe in the benefits to manufacturers from increased consumption, whether in winter or summer.

We are sorry to read of continued complaints of deficiency in the supply of gas at Leeds. We take it, without expressing a confident opinion, which we have no right to do, that the distributing plant of the Corporation is inadequate to fulfil the demands made upon it. They had better, therefore, at once take the bull by the horns, and, at whatever cost, replace the mains laid by the old Companies by pipes of larger calibre. If this be done, complaints of insufficient supply and want of pressure will cease.

The half-yearly meeting of the Barnet District Gas and Water Company will be held on the 28th inst. The accounts and the report of the Directors, which have been issued in anticipation of the meeting, show that the Company are doing "as "well as could be expected." The gas-rental shows an increase of £404 5s. 10d. over that of the corresponding period of last year, and in the water-rental an increase of £368 0s. 7d. There is a curious anomaly in connection with this Company, which we do not understand. People in New Barnet complain to us that, living near to the works, they pay sixpence per thousand feet more than consumers in Old Barnet, about a mile and a half distant. The dividends to be paid by the Company for the last half year are the same as have been divided during the past few years—namely, four and three-quarters per cent. on the A stock, and three and three-quarters per cent. on the B stock. The supply of water seems now to be reassured, the new well yielding more than sufficient for present wants, while the enlargement of the bore of the old well promises to furnish an adequate supply for the growing requirements of the district.

The half-yearly meeting of the Cork Gas Consumers Company was held on the 14th inst., when the usual dividend of eight per cent. was declared, leaving £898 to be carried to the reserve-fund. Previous to the allocation of these amounts, £538 (being half the costs of the prosecution of their defaulting Accountant) had been written off, £600 had been set aside for the depreciation-fund, and £2000 invested in railway debentures—for what purpose the report does not make clear to us. The Company have been fortunate in having a large and ready sale for their coke, but they have been greatly troubled with deposits of naphthaline in the pipes, which will probably induce them, in another severe winter, to make a more liberal use of cannel. The Cork Gas Company are altogether very favourably circumstanced. Shareholders have not been alarmed by the electric light, and the value of their shares has been well maintained, while those of so many other Companies have gone down in price, under the influence of the "scare."

The Weymouth Consumers Gas Company have had a very successful half year's working, and are able to pay full statutory dividends, free of income-tax, on both original and new capital, and carry forward a fair balance. There have been, however, some things which have a little clouded the general prosperity. Coke, produced in larger quantity, brought less than the smaller quantity did in the corresponding period of last year. The Company worked up their own ammoniacal liquor, but were obliged to desist for a time, in consequence of allegations of nuisance. Operations have recently been resumed, but the price of sulphate is now so low, that only a bare profit is obtained. Great complaints are made by the Directors at the new assessment, which, it would appear, has quadrupled the rates and taxes payable by the Company. We fear that many of the re-assessments lately made have been excessive, and we would recommend that in every case where the new rate is thought to be extortionate, the Company affected should appeal.

The Bury St. Edmund's Gas Company have also had a very good half year's working, and are able to pay their usual dividends. It seems clear that they have not gone to Parliament for further powers a day too soon. Additional capital appears to be urgently needed, for the extension of works and for relaying mains. It is always a question how much of this latter operation should be charged to capital, but the practice at present followed is perfectly correct. We have heard complaints of deficiency in the supply of gas in Bury St. Edmund's, which the Chairman, in his speech, clearly accounted for. It seems that some of the old pipes, recently taken up, "were so choked, that the head of "a needle could scarcely be passed through the centre of them." There is now, it seems, no prospect of the undertaking being transferred to the Corporate Authority. The public feeling on the matter was tested, and was found to be decidedly against purchase.

The sale by auction of shares in the Woolwich Equitable and the Woolwich Consumers Gas Companies, which took place recently at Woolwich, seems to indicate that the "scare" has not completely passed away; but, at the same time, shows that investors are plentiful, and liberal in their bids. What induced the Proprietors to part with their shares we can only guess. We have mentioned the "scare;" but the times are hard, and private reasons may have suggested the sale of property on which a considerable profit was tolerably certain to be made. The prices obtained show that investors are content with five per cent., or a little less—a fact which, we think, evidences the confidence of the public in the stability of gas undertakings.

The Gas Commissioners of Dundee have hit upon a very happy idea. There has recently been an exhibition of the electric light there, and the motive force was obtained from a gas-engine—of what power we are not told. The display of the light has been discontinued, and its place has been taken by a lamp in which the quantity of gas consumed by the engine, *plus* the ordinary consumption of the lamp, was burned. The experiment seems to have afforded general satisfaction. The Dundee Commissioners have no excuse for not giving an effective public illumination. They have the sole control of the public lamps, and no one would complain if the rates were a little higher, provided a better light were given. Our friendly contemporary, the *Dundee Advertiser*, well describes the melancholy effects produced by the electric light, which we believe to be perfectly true. Certainly, the new light is not yet adapted for general use.

The Hampton Court Gas Company, it appears, fail to give satisfaction to the consumers in Teddington and the neighbourhood, in respect to both quality and price. The railway stations seem to be very insufficiently lighted, according to the allegations; but this is surely the fault of the Railway Company, who do not provide a sufficient number of lamps, or properly attend to those they have. Private consumers complain that they have to supplement gaslight with petroleum lamps, or they would be unable to see to read. There are also the usual complaints of exaggerated charges when but little gas has been consumed. Of course, the bulk of the complaints arises from the bad fittings used by the consumers, and perhaps a little trouble taken by the Gas Company would remove the causes of dissatisfaction. It must, however, be explained to consumers, that no efforts on the part of the Gas Company can altogether prevent the deposition of naphthaline in service-pipes, and this, after bad burners, is, of course, the chief *fons et origo malorum*. Mr. Price, the Gas Company's spokesman, mentioned the oxidation of burners as one cause of the deficient illumination. The Company ought not to allow any metallic nipples within their district, and might perhaps find it to their interest to send round a man to remove all the burners so constructed, and replace them gratuitously with those having steatite tops.

The Silber Light Company, Limited, do not appear to have been very successful. Mr. Silber sold his patent rights to the Company, in 1873, for £25,000 in cash and four thousand fully paid-up shares, on which no dividends were to be paid until certain profits had been realized and a reserve-fund formed. We may take it that ever since the formation of the Company, the business has been carried on at a loss. After an investigation by a professional Accountant, a majority of the Shareholders decided on a liquidation, and it was afterwards agreed to re-sell the undertaking to Mr. Silber, in consideration of the payment of £32,000, he taking over all the debts and liabilities of the Company. The £32,000 would have given back to every investor £4 per share; but there are recalcitrant Shareholders who are dissatisfied with this arrangement, and have thrown the affair into Chancery, where we must leave it.

Times, it is true, are hard, and rigid economies have to be practised; but, perhaps, the most curious proposal to effect economy was made by a member of the Maesteg Local Board, who, at the last meeting of that body, moved—"That the public "lamps be not lighted while the depression of trade lasts." The proposition fell to the ground, to the discomfiture of the proposer, who, perhaps, desired to keep people at home, and there use more light.

We must be careful how we calculate, from the amount of coals reputedly used in the gas undertaking of a Local Board, the quantity of gas it ought to yield. We gather, from a "stormy" discussion at a recent meeting of the Heywood Local Board, that as much as twenty tons have been sent from the gas-works in one year, for use in the office of the Water-Works Committee. As it would appear that only one fire is kept going there, the quantity looks rather large. It is really only a trifling matter; but we do like to see gas accounts kept straight.

Water and Sanitary Notes.

THE supply of water from Loch Katrine to Glasgow is being slowly reduced. Many years ago we prophesied that some portions of the aqueduct leading from the lake to the city would fall to pieces, and this prophecy seems actually to be in process of realization. Obstructions are now said to exist, which interfere with the flow to the extent of five million gallons per diem. This is something serious. Glasgow looks to Loch Katrine to furnish fifty million gallons of water per day, but with this obstruction, and making certain other allowances, the lake only furnishes forty millions. There is an enormous waste of water in Glasgow. If this were checked, the present sources from Gorbals and Loch Katrine would prove more than sufficient for a domestic service; and when the river-works, for the supply of manufacturers from the Clyde, are in operation, Glasgow might once more look with satisfaction on its water arrangements. But in process of time the aqueduct will require to be overhauled—a work upon which the Commissioners look with alarm.

Another large water undertaking is about to pass into the hands of a Local Authority. The Corporation of Derby have an Improvement Bill before Parliament, which, among other things, was to authorize them to make a compulsory purchase of the works of the Derby Water Company. The latter have, however, come to terms, and a costly contest will thus be saved. We always object, upon principle, to the transfer of a commercial undertaking to a Corporation. But there are circumstances which may justify a Company in parting with their property, and even encourage them in so doing. One of these is when a full and satisfactory price can be obtained. Let us see how the Derby Company are to fare in this respect. The present paid-up capital of the Company is £136,000, and they have a mortgage debt of £43,000. This latter will, of course, be taken over by the Corporation, and, therefore, may be left out of consideration. The purchase-money agreed upon is £308,000, payable in cash, but which will, of course, be paid by the issue of annuities. The arrangements for these payments are not made clear by the report of the proceedings of the Town Council, which lies before us. One thing only appears evident—viz., that the Corporation are to pay £308,000 for an undertaking with a paid-up capital of £136,000, which represents twenty-five years purchase of something more than eight per cent. on that capital. There are several members of the Town Council of Derby who regard the price as excessive, and yet are glad to be able to secure the undertaking. We consider the price to be simply reasonable, and hope the inhabitants of Derby will be supplied with water as well by the Corporation as under the old arrangements.

Mr. E. S. Howard's motion for a Royal Commission to inquire into the question of the supply of water to the manufacturing districts of Lancashire and the West of Yorkshire, and as to whether it is expedient to resort to the Lakes to make up the deficiency, is intended, we believe, to save Thirlmere from the so-called desecration of being put to a useful purpose, by showing that an ample supply of water can be drawn from other sources. We have no doubt that a large supply might be obtained by impounding and catchment systems in the North of England; but that is not the whole question. In Thirlmere we have the water already caught and impounded by Nature's own hand, and, no doubt, intended for the use of man, when he should want it. We do not believe the Government will consent to the appointment of a Royal Commission to inquire into matters which are very well known, and this evening, no doubt, Mr. Howard will be told that his proposal cannot be entertained. We have enough Royal Commissions on hand already, and do not desire to see any more, for they are rather expensive luxuries.

The Government, we must admit, are showing some activity in dealing with water questions. We are to have a Bill to provide for the formation of River Conservancy Boards all over the kingdom, and also to deal with the vexed question of the Prevention of Floods. This Bill will, probably, hang over for a session, if not for two; for it will involve a vast amount of discussion in both Houses. Perhaps, in the end, we may find another Royal Commission asked for, whose duty shall be to map out England into watershed areas.

The Vestry of St. Martin's-in-the-Fields are taking up the cudgels against the Metropolitan Water Companies, and are inviting all other Vestries and similar bodies to join them. So far as appointing delegates to attend meetings goes, we have no doubt the St. Martin's Vestry will have a great success; but what can come of the "spouting" which will presently be emitted, we do not see. If the Metropolitan Board can do nothing in the matter, what can the disjointed, dislocated Vestries and District Boards effect? The first thing to be done is to call into existence a popular body, which can be safely trusted with the control of the water supply. The Government have decided that the Metropolitan Board are not such a body, and the Board have shown a wise discretion in not introducing the Purchase Bill of which they last November gave notice.

It seems to be a difficult matter to screw the truth out of the Metropolitan Board. Our readers will remember that great efforts have been made to obtain a return of the exact amount of the expense incurred in preparing and promoting the two Water Bills which were presented to Parliament last year. With much reluctance, a majority of the Board requested the Works and General Purposes Committee to furnish such a statement. Last Friday a return was made, in accordance with the direction of the Board. It was immediately challenged as not being full and complete, and was referred back to the Committee, for further consideration. According to this return, the costs incurred—that is, the claims already sent in—have only been a little under £16,000; but it is expected that some of the claimants—the Engineers in particular—will reduce the amount of their charges, so that the ultimate cost may appear much lower than is at present stated. Truth to say, we should not consider the outlay extravagant, if it had been incurred for a reasonable purpose; but the Board must have known, from the outset, that they were engaging in a hopeless enterprise, and that whatever money they spent would certainly be wasted. Some members may not think so; but they will find that, whenever the Board renew their attacks upon the Water Companies, the same expenses will have to be incurred over again.

WATER BILLS FOR 1879.

THERE are eight Companies, either entirely new, or who have been working without statutory powers, now seeking incorporation; and six Companies, already incorporated, ask for further powers. Fourteen Bills are promoted by Local Authorities, to enable them either to purchase water undertakings, or to acquire extended powers in respect of those they already possess.

The Bills promoted by the new Companies are as follows:—

The *Aldrington Estate Water Bill* is to incorporate a Company to supply water to a plot of land which is slowly being built over. This land lies within the limits of the Shoreham and District Water-Works Company, who are ready and willing to give a supply of water as it may be required. The capital asked for is £20,000, to be raised by the issue of £10 shares, carrying the usual borrowing power. The source of the water is to be a well in the chalk. The rates proposed are rather high, being seven and a half per cent. on the gross annual rent for an ordinary domestic supply, with extra charges of 20s. for a bath and closets more than one. Water supplied for other than domestic purposes is to be charged for by agreement. Of course, all the powers usually sought for by Water Companies are prayed. This Bill will probably give rise to a contest in Parliament.

The *Colwyn Bay and Pwllycrochon Estate Water Bill* is to give authority to owners of estates bearing the above name to supply water within their limits. The estates would appear to lie within the district of the Conway Union, who also propose to supply water. The owners of the estates, anxious to avoid, as we read the preamble, paying rates to the Conway Union, desire to provide a supply of water to their own property. The Company have already works, but propose to add to them by sinking a well and intercepting streams or brooks on or near to their property. The rates for a domestic supply, and the extras, are of the usual amount. The paid-up capital of the Company for the time being is to be deemed £10,000. All the usual powers granted to Water Companies are sought for.

The *Dearne Valley Water Bill* is to incorporate a Company for supplying water in certain parishes and townships in the Valley of the Dearne, in the West Riding of York. The district which the Company propose to supply lies within the limits of the late Wakefield Water-Works Company, but they did nothing towards furnishing a supply. The privilege naturally passed over to the Wakefield Corporation, who also have done nothing, but have expressed their willingness to part with the powers granted to the Wakefield Water Company, for a consideration to be fixed by agreement or arbitration. The capital proposed by the promoters of this Company is £30,000, carrying the usual borrowing powers. The domestic rates and extras proposed to be charged are about those generally levied. All the usual powers granted to a company, for the prevention of waste and the removal of fittings, are sought.

The *East Retford Water Bill* is to incorporate a Company who undertake to afford a better supply of water to East Retford and several neighbouring townships. The source of the water to be supplied is to be a well at East Retford, in the parish of Clar-

borough. The capital asked for is £8000, carrying the usual borrowing powers. The rates proposed to be charged for a domestic supply are seven per cent. of the rateable value, and for extras, 10s. for the first bath, and 5s. for any others; an extra closet also 5s. The rates are to be paid a quarter in advance. All the usual powers granted to a Water Company are, of course, prayed.

The *Knutsford Light and Water Bill*, so far as water is concerned, is to enable the Company to maintain and continue their present works. The water to be supplied is to be as effectually filtered as possible. Water supplied for domestic purposes is to be charged five per cent. on the rack-rent, with an extra charge of 12s. for every bath, and 8s. for every closet more than one. Any consumer in a row of tenements supplied by one pipe, who indulges his neighbour outside with a supply, is to be fined £5. For the rest, the provisions are only those usually conceded to Water Companies.

The *Sleaford Water Bill* is to incorporate a new Company, who undertake to furnish a supply of water to the town of Sleaford and the neighbourhood. The capital of the Company is to be £6000, carrying the usual borrowing powers. The source of the water is to be a spring called "Piper's Hole," and the Company take power to intercept and impound all water issuing from this spring. The rates proposed to be levied for a domestic supply are seven per cent. on houses under the value of £30, and six per cent. on those that are above, with extras of about the usual amount. The rates are to be paid a quarter in advance. Beyond this the Company only ask for the powers usually granted to a Water Company.

The *Southend Water Bill* is to incorporate the Southend Water Company with extended powers. In 1870 a Limited Company was formed to take over some small existing works. They started with a capital of £20,000, all of which has been expended, and they have no mortgage debt. Southend has greatly increased in size, hence, a much larger demand for water, which the Company seeking incorporation now wish to supply. In order to meet the increased demands, the Company ask power to raise £60,000 additional capital. Power is sought to borrow to the usual extent on both original and additional capital. The source of the water is to be a well in the chalk, situated in the parish of Bridewell. The rates proposed to be levied are seven per cent. on houses under the value of £40, six and a half per cent. on those under £80, and six per cent. on those above £80, with the usual rates for extras. The powers usually granted to a Water Company are prayed.

The *Westgate and Birchington Gas and Water Bill*, so far as water supply is concerned, is to authorize the Company, to which allusion has before been made, to sink a well and erect a pumping-station in the parish of Acol. The works, which are, of course, described in detail, are to be executed within five years. The Company offer to contract for the supply of water, in bulk or otherwise, to Local Authorities, on such terms and conditions as the former may think fit. The Company ask not to be compelled to raise water higher than their pumping-station will carry it. The rates proposed are much the same as usual, and power is asked to collect them in advance. The Company ask authority to supply for other than domestic purposes, at prices to be settled by agreement, but, as usual, make domestic supply a primary consideration. They ask to have as full control over fittings as it is desirable that every Water Company should possess. For the rest, the Company ask for the fullest power granted to a water undertaking.

The following Bills are promoted by Companies already incorporated:—

The *Colchester Water Bill* is to authorize the Colchester Water Company to raise further capital, and extend their limits of supply. The original capital of the Company is to be deemed to be £35,000, which this Bill proposes to convert into stock. Power is sought to raise an additional £35,000, in stock or ordinary or preference shares, of the nominal value of £10 each. Power is further asked to borrow £8000 in respect of the original capital, and a like sum in respect of the new. The Company are at present called the Company of Proprietors of the Colchester Water-Works, and for the future, if this Bill pass, will be simply known as the Colchester Water Company. The rates for a domestic supply, and the charges for extras, are about the same as those usually levied. For the rest, the Company seek all the powers usually granted in respect of a water undertaking.

The *Grand Junction Water Company's Bill* is promoted simply to remedy a mistake in their Act of 1878, which concerns no one but the Proprietors.

The *New River Company's Bill* is promoted to authorize the Company to raise an additional £500,000, entitled to only four per cent. interest.

The *Nottingham Water-Works Bill* is to extend the limits of the Nottingham Water-Works Company, so as to include several parishes, all in the county of Nottingham. Power is sought to make additional works, and for this purpose authority is asked to purchase, by agreement, twenty acres of land. No further capital is sought.

The *Portsmouth Water Bill* is to enable the Borough of Portsmouth Water-Works Company to raise additional capital, to the extent of £45,000, carrying, of course, the usual borrowing powers. The Company seek authority to acquire additional lands, part by agreement and part by compulsion. The Bill presents no feature of general interest.

The *Weardale and Shildon District Water-Works Bill* is to authorize an extension of limits, and the raising of further capital. As our readers have been informed, the Company have agreed to purchase the undertaking of the Durham Water Company, and, therefore, require further capital. The present capital of the Company is £750,000, with borrowing powers to the extent of one-fourth. The capital of the Durham Company is £32,500, and they have borrowed no money. The Weardale Company now ask to raise capital to the extent of £100,000, carrying the usual borrowing powers. The consideration for the purchase of the Durham Company is to be the issue of 1600 shares of the nominal value of £25 each in the Weardale Company, which are, of course, to be divided rateably among the existing Proprietors of the Durham Company. Some additions are proposed to be made to the works, and the Company seek power to acquire further land, part by compulsion and part by agreement.

The following Bills are promoted by Local Authorities to obtain powers with respect to the supply of water:—

The *Arlecdon and Frizington Water Bill* is to authorize the Whitehaven Union Rural Sanitary Authority to construct waterworks for the supply of the drainage district bearing the above name, for which purpose they ask power to borrow £13,000. The rates for an ordinary domestic supply are about those usually levied, and extras are to be charged according to rental. Thus a £10 house will pay 5s. for a bath; a £20 house, 6s.; and so on upwards; it being thought, we suppose, that the better the houses they live in, the cleaner the inhabitants will keep themselves. Every closet after the second is to be charged 5s. The Local Authority seek power to supply fittings, and to raise their charges as they borrow money.

The *Belfast Water Bill* is first of all to extend the time for the compulsory purchase, by the Belfast Water Commissioners, of certain lands, authorized by their Act of 1874, and also to make certain works. For this purpose the Commissioners seek power to borrow £170,000.

The *Birmingham Corporation Water Bill* is promoted to obtain the same objects as those sought for in the last-named Bill, with this difference, that the Birmingham Corporation seek power to borrow an additional sum of £300,000.

The *Cardiff Corporation Bill* is to authorize the Corporation to purchase the undertaking of the Cardiff Water Company. The paid-up capital of the Company is £121,631, and they owe on mortgage £20,450. The consideration to be paid for the undertaking is £300,000, the Corporation taking over the mortgage debt of the Company. For the purposes of this Bill, the Corporation seek power to borrow £490,000. The net profits, after forming a reserve-fund for special contingencies, which is not to exceed £10,000, are to go to the district-fund.

The *Exeter Corporation Gas* [and Water] *Bill* is to empower the Corporation to alter their charges for the supply of water. The 32nd section of the Corporation's Act of last year authorized them to charge five per cent. on the annual value of each house. It is proposed, in the Bill we now notice, to charge seven and a half per cent. on houses of the value of £20 per annum, with a downward scale as the annual value of the house rises; the old rate of five per cent. being reached when the premises are valued between £50 and £100. We question very much, whether the lower middle class in Exeter will appreciate this alteration.

(To be continued.)

Reduction in the Price of Gas at Dorking.—The Dorking Gas Company have announced that from the 31st of March next the price of gas will be reduced to 5s. per 1000 cubic feet.

Another Improvement in Street Lighting by Gas.—A new reflecting street-lamp has recently been fixed in High Holborn, opposite Gray's Inn Gateway, which, seeing that no increase has been made in the quantity of gas consumed, must be considered very effective. We are informed it has been made by Messrs. D. Hulett and Co., of Holborn, and is used with one of their duplex-flame governor burners. This firm has also fixed one of their new lamps in Bedford Row, the advantage of which is very apparent, the burner used being the ordinary 4-feet burner, with governor in use in the parish.

COAL NEAR LONDON.

THE problem as to the presence of coal in the south-east of England calls for a further attempt at its solution. When it was proved by Mr. Etheridge that the deep boring at Messrs. Meux's brewery, at the corner of Tottenham Court Road and Oxford Street, had entered Devonian rocks, it was argued by some parties that all hope of finding coal near London was at an end. Those who advocated this view must have failed to appreciate the significance of one important fact—namely, that the cores brought up by the diamond drill showed the Devonian strata to be inclined at a very high angle. This circumstance affected the whole argument, and we are glad to find the distinguished geologists specially cognizant of this interesting question are by no means in despair as to the possibility of reaching the carboniferous strata—if not exactly under London—at least, somewhere along the eastern valley of the Thames. In the volume recording the transactions of the British Association for 1878, just published, is the report of a Committee, consisting of Mr. Godwin-Austen, Professor Prestwich, Mr. Davidson, Mr. Etheridge, Mr. Willett, and Mr. Topley, appointed for the purpose of assisting the Kentish Boring Exploration. The report is drawn up by Mr. Godwin-Austen, who expresses his regret that nothing had been done during the previous year to warrant an application for any portion of the grant placed at the disposal of the Committee. The need was all the less, seeing that private enterprise had furnished results giving an affirmative answer to one important question—namely, whether Palæozoic rocks might underlie the chalk formation of some part of the south-east of England.

The report states that so soon as it was ascertained that at the corner of Tottenham Court Road and Oxford Street, there occurred characteristic upper Devonian strata at about a thousand feet from the surface, "the whole question, and all that is in- "volved, seemed to be answered, and the supposition of the "Report of the Coal Commission, which, as far back as 1871, had "indicated the line of the Thames Valley as that of the course "of the said Palæozoic band, was proved to be correct." Mr. Godwin-Austen, in giving evidence before the Coal Commission, replied in the affirmative to the question—"You would be "disposed, then, to carry the line of probable coal-measures "under the valley of the Thames?" The correctness of this expectation is pointed out by the present report, in relation to recent discoveries. One single point, we are told, remains in doubt—that is to say, in which direction from the end of Tottenham Court Road may the mountain limestone and coal-measure formations be looked for? The angle which the Devonian strata at Messrs. Meux's made with the vertical bore, is thirty degrees, and it is inferred that the general direction is east and west. It is admitted that, if these beds had not been found highly inclined, but lying in a horizontal position, "the prospect "would not have been encouraging." As it is, we have the inference that "the Devonian beds come down upon at the "Tottenham boring may be safely taken as a continuation of "the band which crosses Belgium and the North of France, and "are followed, as the band is there, by the mountain limestone "and coal-measure series in a deep east and west fold or trough."

To settle the question as to the direction of the dip, it is submitted that there should be another boring, situated so near to that at Messrs. Meux's as to make one boring illustrative of the other, thereby showing the dimensions and position of the Palæozoic band beneath London. For this purpose it is considered that the new boring should not be at a greater distance from the previous one than a quarter of a mile, in a direction north or south. The Committee look upon the existing results as indicating that the Franco-Belgian Palæozoic band with which coal is associated "is continued under London," and lies within narrow limits. Should this prove to be the case, it is not supposed that coal existing in such a position "could be made "available." Building land, we presume, would be too valuable, and burrowing under London for coal would certainly be a nuisance. "Dreadful Colliery Explosion near the British "Museum" would look very striking in a newspaper placard, but would cause regret in many quarters that coal had ever been found in such vicinity. It is a curious fact, that when Mr. Hussey Vivian moved, in the House of Commons, for a Royal Commission to inquire into the extent of the coal measures, he suggested that possibly coal might be found beneath the Houses of Parliament. The proximity of coal to the Metropolis is gradually becoming more apparent. The discovery of a coal seam at Burford, in Oxfordshire, north of Marlborough, is mentioned by Mr. Etheridge as bringing the coal measures seventy-five miles nearer London. The report made to the British Association explains that the object of completing the results arrived at by Messrs. Meux is to add to our knowledge of the whole of the band at that place. This knowledge, there is reason to hope, "would lead us to the direction "in which the band should be followed both east and west." The commercial value attaching to the discovery of productive coal measures in the south-east of England, and away westward, is urged as a reason why the investigation should be made complete. It is a little provoking to know that half the money spent upon the Sub-Wealden researches at Netherfield would long since have settled the theoretical speculation whether the coal measures might be found along the line of the Thames Valley. No blame, however, is imputed to the promoters of that boring. With so much encouragement as now presents itself, we may trust that the requisite funds will be forthcoming. If the Lord Mayor and the City Companies were to take the matter up, perhaps the money would be readily found. The means and appliances for deep boring are now immensely improved, and with respect to this coal problem, we have now pretty plain indications as to what should be the next step. There is much clearer light on the subject than was available at the time when Mr. Willett began his arduous undertaking in the Wealden. Some of the zeal which then existed is surely available for the more hopeful enterprise which has now to be undertaken!

The depth at which the coal is likely to be found is, of course, a matter of importance, so also the quantity and quality of the article. Sir Roderick Murchison was a great opponent of the notion that the Franco-Belgian coal band extended into the south-east of England. This eminent geologist, the Chairman of the Coal Commission, contended that the formations with which the continental coal measures are associated do not cross the Channel, and that, if they do, the coal they contain will be found worthless. Mr. Godwin-Austen is well known as contending for the probability of finding coal in the south-east of England, and there is presumptive evidence that his views are sound, seeing that in several instances they have proved correct, so far as relates to the position of the Primary rocks and to the absence or thinning out of the Secondary strata. Eleven years have elapsed since he gave his evidence before the Royal Commission. He did not favour the idea of finding a productive coal-field in the Wealden, though he believed the Palæozoic rocks were to be found there, to the exclusion of a great mass of the Secondary strata. With reference to the Lower Greensand formation, which has been looked upon as likely to yield a valuable supply of water for the Metropolis, Mr. Godwin-Austen said, "We have every reason "to suppose that, beneath London, the Lower Greensand is as "nothing compared with that which is in the hills of Surrey "and Kent;" adding, "I should not have been at all astonished "to hear that, had you gone below the Gault at New Cross, you "would have found that there was very little Greensand there; "and, in the same way, I think that it will be wanting over a "large area of Palæozoic rocks going north again." We see that at Messrs. Meux's the Lower Greensand was reached; but its thickness was rather less than seventy feet, and its extremely hard and compact character rendered it useless as a water-bearing stratum. Immediately below it came the Devonian beds. At Crossness, a deep boring conducted by the Metropolitan Board of Works—being the second attempt to reach the Lower Greensand—passed through the Gault into either the Old or the New Red Sandstone, the Old Red being the most likely.

The arguments of Sir R. Murchison were partly based on what he called "the wretched appearance of the coal in the "Boulonnais." This was really beside the question, the coal which Mr. Godwin-Austen looked for in England having no relation to the Boulonnais beds. There is also some difference of opinion as to the quality of the Boulonnais coal, some accounts representing it as very good. In quantity it may be deficient; but let its character be what it may, it is to be looked upon as separate and distinct from the Valenciennes coal, seeing that it is lodged on the southern side of the axis of Artois. North of that axis, we have the coal of the Pas de Calais, and the line is carried east through the coal basins of Valenciennes, Charleroi, and Liège. The Kentish Exploration Committee, in a circular which they issued last year, state that the Palæozoic rocks of the Ardennes, together with the valuable associated coal basins of Liège and Charleroi, pass under the chalk and the Tertiary strata of the North of France, and have been traced, at a depth of from two hundred to six hundred feet, to Valenciennes, followed more recently by their discovery in the neighbourhood of Lillers, in the department of the Pas de Calais, "where they are now "largely worked, and yield coal of excellent quality." The strike and character of the strata at Lillers have been found to coincide exactly with those of the Devonian series, and of the coal measures near Marquise, in the Boulonnais. Concerning the latter, the Committee say, "Although the field is of limited "extent, the existence of several good seams of coal has been

"proved." The prolongation of the strike of these Devonian and Carboniferous rocks agrees with a line drawn under the Lower Greensand and chalk near Hythe and Folkestone, proceeding westward in the direction of the Thames Valley. The same series of rocks, with their flanking coal-basin, re-appear on the surface in the West of England, forming the Mendip Hills, and the Somersetshire and Bristol coal-fields. In the evidence which he gave in 1868, Mr. Godwin-Austen said: "It is almost "impossible to resist the impression, that in some intermediate "position, as along the line of the Thames Valley, you have a "continuation of the Belgian and French coal-basin, passing "along in a westerly direction." "I mean," he added, "that "you have an extension of the coal-field of the Pas de Calais." We find Mr. Godwin-Austen further saying: "Were I a Kentish "or Essex landowner, I should be very much disposed to sink, "along a line parallel to the chalk escarpment of Kent—to the "north-east of it." When asked at what distance he would operate, he replied, "I cannot say exactly, but I will call atten- "tion to something presently, which will show that one edge of "the coal-band may go near to the line of the escarpment." With this evidence given in 1868, it certainly seems a matter for regret that the Wealden boring was pursued in preference to an exploration in the Thames Valley. We find Mr. Godwin-Austen also saying, in further explanation of his views: "I "have imagined that if a productive coal-field is carried on into "our area from the North of France area, it conforms generally "to the line of the Valley of the Thames, until it meets the "Valley of the Kennet, and that then it turns away; that it "is parallel to the chalk escarpment of Kent as far as the "Medway, and that then it runs parallel to this part of the "Weald, which represents the Hog's Back and the hills from "Maidstone to Farnham; and that finally it goes out and con- "ducts us to the coal-field known as that of Bath and Bristol."

The theory propounded by Mr. Godwin-Austen dates back from 1855, and the progress of geological discovery has helped to confirm it, though as yet we stop short of the final result. A very curious fact mentioned in this gentleman's evidence before the Royal Commission is worthy of remembrance. When a certain tunnel was being cut through the chalk for the London, Chatham, and Dover Railway, a few miles from Dover, the workmen came upon a great black mass of highly bituminous matter. The position of the mass was across the tunnel, neither did it lie in the plane of the bedding of the chalk. It was speedily concealed from view by the building up of the brick walls of the tunnel, and its full extent was not determined. Specimens of the substance showed that it was not actual coal, though highly inflammable and bituminous, being by no means a shaley substance. It was very curious that such a discovery should be made on the line which Mr. Godwin-Austen had drawn between Belgium and Somersetshire, and it is not surprising that he should look upon it as decidedly important in connection with his theory. In his explanation of the phenomenon, he said, "I imagine that a fissure in the chalk must "have been created at some remote period, and that by "the position of those beds, being superior to the carboniferous "strata now underlying them, the whole mass of bituminous "matter then formed had escaped upwards from the coal." This is certainly coming very near to the actual discovery of coal, and it seems strange that there is so little enterprise of the right kind as to leave so important a question as the existence of coal near London to be determined by mere accident. The Wealden boring is the only instance in which geological research, in reference to this problem, has been promoted by an organized effort, based on public spirit and scientific zeal. At Burford, in Oxfordshire, already mentioned, a shaft has been sunk by a private gentleman in search of profit or benefit of some kind for himself, and coal has, in consequence, been found there. Either private or public interest, or the two combined, ought to take the matter in hand near London. It may not be altogether desirable that we should have coal-pits in Kent or Essex; but the material benefit to the Metropolis would be great.

Bordeaux Gas Company.—At the last general meeting of this Company a dividend of 28 frs. 12·5 c. (£1 2s. 6d.) on the fully paid-up shares was declared, making, with the interim dividend of 9 frs. 37·5 c. (7s. 6d.) paid in July last, a total dividend of 37 frs. 50 c. (£1 10s.) for the year's working. On the other classes of shares and securities of the Company, the dividends were 12 frs. 50 c. (10s.), 12 frs. 12 c. (9s. 8d.), and 11 frs. 87 c. (9s. 6d.) respectively. The balance-sheet to the 30th of June last showed that the Company's liabilities amounted to 8,155,385 frs. (£326,215), to meet which they had assets to the value of 8,534,754 frs. (£341,390); showing a balance in the Company's favour of 379,369 frs. (£15,175). This, with the sum of 56,250 frs. (£2250) paid on account of dividend, made a total of 435,619 frs. (£17,425). Out of this amount 368,415 frs. (£14,737) were employed in the payment of the balance of dividend and the management and other expenses, including the usual additions to the reserve and sinking funds, leaving 67,204 frs. (£2688) to be carried forward.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

CLXX.

THE TREATMENT OF RESIDUAL PRODUCTS.

Distillation of Coal Tar.—The Scotch System (*continued*).

The last distillate, which we may call re-run naphtha, is now to be treated with sulphuric acid, followed by caustic soda. Lime may be substituted for the latter, as being an economical substitute, but it requires far more care, and, if used in excess, will cause trouble and additional work, which, with such volatile products, always involves loss.

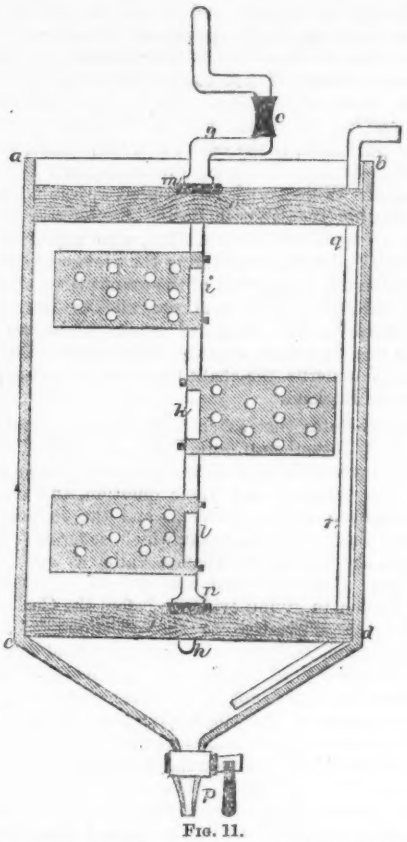


Fig. 11.

The apparatus shown in fig. 11 is well adapted for the purpose of the treatment of the re-run naphthas with sulphuric acid and caustic soda. A large wooden or iron vessel, *a b c d*, tapered towards the bottom, is lined with lead. The soldering is preferably done by the blow-pipe, in the same manner as sulphuric acid chambers. It is securely fixed in a vertical position. Two horizontal beams, *e* and *f*, made of wood, covered with lead, or, if preferred, of cast iron, serve to support the shaft, *g h*. Fixed to this shaft, by pinching screws, are three cast-iron blades, *i k l*. They are pierced with holes about an inch in diameter. If desired, they may be made of wood, covered with lead. The shaft works on cast metal bearings at *m* and *n*. The shaft, *g h*, is bent, at its upper extremity, into a crank, having a loose cylinder of iron piping at *o* to facilitate the rotation in the workman's hands. In most cases it is better to have this done by a steam-engine. The top, *p*, enables the contents of the mixing apparatus to be removed, but it is more especially used for drawing off the "sludge." The sludge is the tarry fluids which results from the action of sulphuric acid upon the olefines, the bases, and other impurities contained in the re-run naphtha.

The blades, *i k l*, are so placed as to escape the sides of the cylinder, *a b c d*, by a sufficient space to allow the syphon, *q r*, to reach nearly to the bottom. This syphon is connected with the pump which charges the rectifying still.

Four hundred gallons of re-run naphtha having been pumped into the agitator, four and a half gallons of strong sulphuric acid are added, the agitator being worked briskly during the addition. The acid is not poured at once into the naphtha, but is made to fall into it in the form of fine rain, so as to promote its thorough incorporation. With this view, two leaden gutters, *a b c d*, fig. 12, are laid across the top of the agitator. They rest on two moveable pieces of wood, *e f*, which, during the addition of the acid, rest on the upper edge of the apparatus. The gutters are pierced with a great number of very fine holes, which serve to distribute the acid. The agitation should be kept up for five minutes. The whole is then allowed to rest for about the same time. The sludge is then to be run off by the stopcock, *p*, great care being taken to prevent any naphtha running away at the same time. The entire operation is then to be repeated, precaution being taken not to keep up the agitation long enough to allow the charge to heat. Some operators repeat the operation once more with the same quantities, but, instead of using the sulphuric acid alone, a mixture of nitric and sulphuric acid is employed.

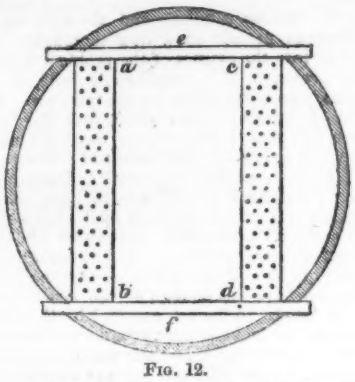


FIG. 12.

The proportions for this purpose are nine parts of sulphuric acid by measure to one part of nitric acid of a specific gravity of 1·45, or thereabouts. If this nitro-sulphuric be used, a considerable quantity should be prepared at one time; it may then be stored in glass carboys. The addition of the nitro-sulphuric acid is to be made very gradually, so as to slowly raise the temperature to about 60° C. = 140° Fahr. If, the temperature rises higher, the agitation and addition of acid must be arrested. The object of raising the temperature to this point is to prevent the naphtha acquiring a brown tint on keeping. Other proportions of acid, &c., will be found in treating of the French method of conducting the purification. The French tar distillers also use nitro-sulphuric acid.

After the sludge has been run off, 5 gallons of cold water are to be added gradually, with thorough agitation, the settling and running off to be repeated as usual. It is now necessary to remove the last traces of acid by means of caustic soda. The best strength for the purpose is about 70° of Twaddell's scale, which is represented by a specific gravity of 1·350. It must not be forgotten that the agitator must be provided with a well-fitting cover, to avoid the loss of the more volatile hydrocarbons by evaporation.

After settling for a sufficient length of time, the purified naphtha may be pumped into the finishing or rectifying still. An excellent still for this purpose will be described under the French process; but, if the old-fashioned plan of rectifying in an ordinary still in a current of steam be adopted, great care must be taken that the condensing arrangement is sufficiently powerful to prevent any loss of the more volatile hydrocarbons. The mixture of water and naphtha distilling over should at no time be perceptibly warm to the hand.

The first puncheon distilled should, if the tar be of first-rate quality, contain 30 or 40 per cent. of benzole, according to the mode of testing described in the introduction. The second puncheon will be of the finest class of naphtha for dissolving purposes, and the rest will be an excellent burning naphtha. The residue in the still contains naphtha of high boiling point, and a considerable quantity of naphthalene. It may be distilled with proper precautions, either with the naked fire, or by means of superheated steam. It will then yield an oil sufficiently good for burning in the blast-lamps used in iron foundries, &c.

The naphtha prepared by the above processes should be of extremely good odour, absolutely colourless, and perfectly neutral. Water shaken up with it, and then separated, should not redden litmus paper; and there should not be the faintest smell of naphthalene when a little has been allowed to evaporate on the hand. It should also keep perfectly colourless for at least twelve months.

It would be easy to describe a vast number of modifications of the general process for working coal naphtha; but it is quite unnecessary, because the method given is capable, if properly carried out, of yielding excellent results. The agitator, fig. 11, may, if preferred, be made horizontal instead of vertical; but, for coal naphtha, there are some advantages in the form given. The treatments with caustic soda may be made in a separate agitator to that used for the sulphuric acid; and where the quantity of naphtha made is very large, there are certain advantages in such an arrangement.

It is absolutely necessary, for the reasons previously given, that all the apparatus connected with the distillation and purification of coal naphtha, should be as far as possible from any fire. It is also proper to have a hose, connected with a plentiful source of water at high pressure, always in readiness. It must be remembered, however, that water will not extinguish burning naphtha; it is therefore only useful as a cooling agent, and to extinguish burning woodwork. It follows as a corollary that there should be as little wood as possible used in the construction of the buildings of a tar factory. It will also be found that the premiums of insurance are much lessened if the buildings are so arranged as to render the communication of fire from one to the other difficult, or, still better, impossible. It is a good plan to have a large heap of sand in the yard, and several hand-barrows, as the writer has often either extinguished or arrested the spread of fire by this means.

It is also a good rule to strictly prohibit any of the men or lads from ever running from one part of the yard to another, unless in the event of accident; it will then be known, and proper precautions taken at once. Smoking in the yard or factory should lead to the immediate dismissal of the culprit. No light should ever be allowed in the still-house, on any pretence. It is very easy to have lights so arranged that, during the short days of winter, the work can proceed all night, if necessary, without any danger to life or property. One method is thus carried out: A square aperture is made in the wall, in a convenient place. It is lined with tin plate, to act as a reflector. It is completely glazed on the inside, so that no vapours can reach the gas flame, unless the glass be broken. To lessen the chances of this, a coarse wire netting is placed in front of the glass. At the back, that is to say, on the outside of the still-house, is an iron or zinc door, which may also be glazed, so that the light is utilized in the yard. A gas-lamp is fixed inside the square chamber formed as described. The gas-flame must be so placed as to render the cracking of the front glass by its heat impossible. It is a proper precaution to protect the back as well as the front glass by wire netting, because a stone thrown at the back window would fracture the front one, unless this precaution were taken.

Communicated Article.

GAS LIGHTING AND DECORATIVE ART.

By "ISCA."

That curious phenomenon of these present times, which is commonly known as the "High Art Revival," is not without interest to the producers of gas, although, at a first glance, nothing could appear to have less connection with gas-works than those peculiar wall-papers, specimens of old blue china, and countless other decorative eccentricities, which, by their growing prevalence, show that the disciples of Messrs. Whistler, Burne-Jones, and other transcendentalists, are becoming a power in the land. But, as a matter of fact, this novel craze bids fair to drive gas lighting from favour in many quarters where it would otherwise find no rival, and where even the electric light (supposing it could be made available) would scarcely prevail against it—that is to say, in the residences of well-to-do people.

Without attempting to follow the new school into all their rhapsodical settings forth of principle and practice, there is one point which seems to be the central idea on which their world revolves, and that is to be briefly expressed in the following proposition:—"Nothing shall be considered fashionable, nor to be allowed in the houses of persons of taste and fashion, which is new, cheap, comfortable, or convenient, or which cannot be traced directly to Japan, China, India, the epoch of the late lamented Queen Anne, or antecedent thereto." The consequence of this is that the use of gas is being tabooed in the houses of the wealthy, and, of course, the small fry hurry to imitate their betters. It is a fact that the sale of first quality gas-fittings by the West-end houses has sunk almost to vanishing point since this article of faith has been promulgated, and the manufacture of moderator lamps from Indian vases, and other similar extraordinary materials, has received a corresponding impetus. How far this mania is destined to spread, and how deep and lasting its effects will prove, are, of course, matters beyond our knowledge or control. We can at most mark the facts, and endeavour to counteract the worst consequences which might possibly ensue, by providing a remedy, if such can be made effective.

We may commence by admitting that to a great extent manufacturers and dealers in gas and the appliances by means of which it is used, have not done their duty to the public by seeing that their customers had the full benefit of the valuable illuminant placed at their disposal. In too many instances—almost universally, in fact—Gas Companies have allowed the gas supplied by them to be burnt under the management of a host of small tradesmen, who could send to Birmingham for a little stock of trashy fittings, and stand revealed as gas-fitters—late blacksmiths or tinkers. The consequences are evident and manifold. First, a bad supply; then, a heavy bill; then, bitter complaints of bad gas; then, a disputed gas account, and final cutting off of the service-pipe. Or, in cases not so flagrant as regards workmanship, the stupid designs and lack of variety in the chandeliers, brackets, &c., have caused many people of artistic perceptions to abjure them altogether. And here is a field for improvement which may be entered upon with good hope of success. Let gas manufacturers include general ornamental fittings among the appliances for the utilization of gas, which they are in many instances endeavouring to improve, or to aid in improving. Are not many people sick of the eternal "two-light" and the everlasting "three-light," with their inane vases, which contain nothing, and their absurd chains, which support nothing? An oil-lamp is what it pretends to be, so is a wax candle—neither is ever made to imitate the appearance of a gaslight; but how many gas-fittings are intended to look like oil-lamps or candles, and make a wretched show in the attempt?

Looked at in one aspect, the modern high-art revival is but another sign of the fact that the schoolmaster is abroad, and that the old mechanical style of design will not pass current any longer, either for gas-fittings or other furniture. The furniture makers have promptly recognized the fact, and, having secured the services of artists with the proper mental twist, are out-heroding Herod in their Whistlerisms, and sky-high patterns generally, with stupendous success. Cannot those whose business it is to manufacture the things which are the visible agents for the combustion of the most ethereal, and, in many respects, simplest luminant of all, introduce something of its character into their work in a greater degree than has hitherto been done? It will not be possible to please those whose chief desire, in providing themselves with furniture, is to get something which nobody else has or can have; but there is still room for greater individuality, beauty, and adaptability in this class of goods than has yet been manifested.

I have been informed that for one particular pattern of gas-bracket and globe, which was figured in a popular magazine some months back, there was an immediate demand. The globe was of clear glass, fluted, so as to break the image of the flame without destroying much light; and the bracket itself was of bright

brass, and very plain. Many persons might fail to see the beauty of this particular pattern; but then again it is scarcely necessary for a cabinet maker to endorse, by his own private approval, every article of art-manufacture he supplies. But that the high-art disciples have sometimes a sound substratum of sense and reason for their ideas, would not be denied by any one who has compared their fire-places, for example, with reflecting tiles and projecting fire-grate, with the common-place sham-registers, apparently intended to send as much heat as possible up the chimney. And, despite the utterly rabid members of the school who would probably prefer blazing pine-knots to light their dining-rooms withal (if the modern Insurance Offices did not object), there are many artistic people among them who would hail any discriminating attempts to meet their desire for improvement, in the direction of artistic design, with a very practical response.

The fact is certain that, apart from the well-worn objections to gas, on the score of damage to gilding, &c., on chemical reasons, what may be called the æsthetic objection is felt in certain circles as one of great value, and should not, therefore, be despised. Instead of letting judgment go by default, and allowing the advancing tide of artistic and economic improvement to submerge gas-fittings altogether, there should be sufficient care taken by those primarily concerned that, as far as possible, the appearance of such appliances shall as well stand a comparison with that of any variety of lamp or candelabrum, as the light of gas may with that derived from oil or wax, or its cleanliness, convenience, and safety with their dirt, inefficiency, and danger.

The problem must be fairly stated, and dealt with from the bottom. A few considerations may be mentioned here, merely to indicate the rational lines upon which chandeliers, &c., should be constructed, in order that some eminent capabilities of gas may be utilized. Every one may then see how, in common practice, many of these are entirely ignored. In the first place, the fundamental law of physics must be borne in mind, that the intensity of light varies as the square of the distance, the neglect of which rule leads to the massing of burners in huge chandeliers, with the result of inferior illumination to that obtainable from fewer burners more carefully distributed. Then it may be laid down, as a rule, that the lights should not be intended or taken as decorations themselves, nor attract the eye as such. We do not look at the sun, although we live in his rays; and artificial lights should be so far like him that we should be conscious of their existence, merely by their effect, and not by their own brilliance.

Gaslights may be on upright stands, suspended from above, or attached to walls. Although, for obvious reasons, the first-named division is the most inconvenient, and least used, it is produced in designs of probably greater artistic elegance than either of the other classes. This is due to the fact that in this form have been made the greatest number of appliances for light-giving which have been in use since the beginning of civilization. It is not a great step, from the blazing fire on the ground to the basket of burning sticks on a pole which formed the cresset of the Dark Ages; and the candle having been introduced, the candle-stick followed. The upright lamp-column is a lineal descendent of these, and the beautiful forms which it often assumes are, more or less, directly copied from ancient models. The suspended light, or chandelier, is, as its name implies, an appliance for burning candles; and the existing examples of Jacobean or Georgian periods show how thoroughly the artists of those days entered into the essence of the problem they had to solve, which was the provision of a considerable body of light from a number of points possessing but moderate radiance. Is it too much to hope from the designers of these times that they may deal with their more powerful agent in the spirit of those old masters, and not in merely slavish copying of their method? Where they used a chandelier of 50 lights, we now endeavour to hang up a pendant of 20 or 30 burners; and, finding the mass of light too powerful, we sagely stifle it in some ground-glass or opal globes, thus reserving for our use the heat and products of combustion of 150 cubic feet of gas per hour, and throwing away the light of perhaps 50 or 70 cubic feet. This result is the more curious, seeing that we are always crying out that we have not enough of the latter quality, and too much of the two former, in the gas supplied by the Companies. On the whole, perhaps, we make a more artistic article when we copy a chandelier—especially in crystal—than when an oil-lamp has been the original model, for in this case we are apparently doomed to have the cumbrous oil-vase (which must have given an infinity of trouble to the old designers, even when it was absolutely essential) inflicted upon us in a bewildering variety of forms, and all ugly, because useless, and therefore false in art, and repugnant to common sense. In but few instances is the impression conveyed to the mind of the spectator that the designer thoroughly comprehends the conditions he has to fulfil, or the end he has to attain.

The exigencies of the hydraulic seal must be credited with causing a great deal of monotony of form in gaseliers, and it is worth noting that no improvement in the means of altering the length of the pendant appears to have been successfully attempted, although the inconveniences of the usual arrangement are generally recognized. Wall-brackets are really the best means of lighting an apartment with gas, in common practice; the light is more distributed, and there are fewer shadows; but, from the simplicity of their general construction, they are too frequently made by thousands, of like, or too similar designs, and a distressing sameness is the result. The propriety of keeping them rigidly to their own use and object, of course, applies to this class as to the others, and, as in them, there appears plenty of scope for designs based, as to first principles, on strict consideration of the objects to be gained, while allowing a refreshing variety in the handiwork and minor details.

There must necessarily be more machine-work about gas-fittings than for either candlesticks or lamps, and, with a certain high-and-dry school of decorators, that fact appears to be an insurmountable hindrance in the way of any attempt to make them as artistic as the latter. But, instead of affecting a lofty disdain of gas and all its belongings, it would be far more creditable to the inventive and decorative ability of the new school, if, after finding out a fault, they would stand up to their work of correcting it; and, having expressed a due amount of horror over the artistic lapses of others, would show the world how they would themselves manage these things. Criticism is all very well, but creation is something better, and it would be little short of a disgrace if the brilliance and convenience of gas are to be lost to any section of modern society, for want of thought or endeavour to render it as ornamental as our forefathers did the far inferior means of illumination known in their day.

Correspondence.

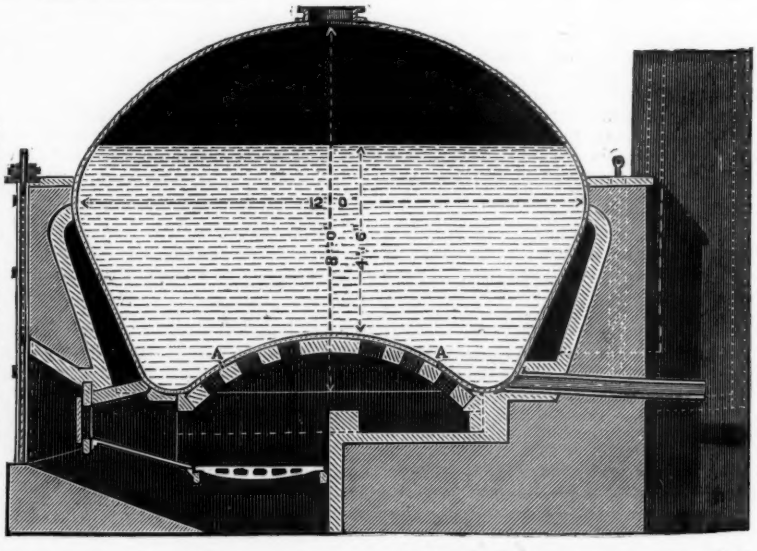
[We do not hold ourselves responsible for the opinions expressed by Correspondents.]

THE DISTILLATION OF TAR.

Sir,—I see by the Journal of the 11th inst., that in your "Treatise" you have arrived at tar distillation, and give drawings of the tar-still. I beg to send you a tracing of a tar-still I designed some years ago. It is much superior to those hitherto in use, which are, I believe, as you show them.

I found myself in possession of tar-works which had been burnt down several times, and which I had to reconstruct. I considered that the ordinary upright still with a wide bottom was defective, both as to economy of fuel and duration of the vessel. The intense heat that has to be employed when driving over the heavy oils, often causes the bottom to fall, notwithstanding the camber it has. When it does so, the pitch cannot be run clean off, and this remaining in the still, soon causes the bottom to require to be renewed. On the other hand, when the bottom springs a leak, a conflagration occurs, which had been the case in the works I refer to.

To remedy those defects, I had the bottom made much smaller than usual, although still considerably larger than the fire. The lagging-plate on which the still rests I carried up to the points A, A, all round, so that, should the exposed centre portion need removal, it could be done by cutting out the central plates at the line of rivets, A, A, while the still remained in its place. The sides, instead of being vertical, were very much bevelled; so that the heat, in traversing the wheel flue, was made to hug the still, instead of, as in the vertical form, expending much of its force on the external brickwork. To prevent fires, I raised the floor of the front part of the ash-pit nearly as high as the furnace-bars, so that, should it become filled with tar, the fire would be extinguished for lack of air. In order further to ensure the extinguishment of a fire, I had a damper, actuated by a pulley and chain, the end of which could be secured at any distance from the still, and by loosening it there let the damper down, and close off all access of air to the ash-pit.



During several years that I worked this still, we never had an accident, and the gentleman to whom the works were afterwards sold told me that it was the best still he had ever seen.

35A, *Great George Street, S.W., Feb.* 14, 1879. George Anderson.

STOKERS WAGES.

Sir,—During this season I have introduced into my retort-house a new description of payment for piece-work. I pay the stokers at the rate of 2½d. per 1000 feet of gas made. I find this system works satisfactorily, and recommend a trial of it by gas managers.

Forfar Gas-Works, Feb. 17, 1879. D. B. Esplin.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, FEB. 17.

CONSERVANCY OF RIVERS.

The Marquis of RIPON asked whether the report was correct that it was the intention of Her Majesty's Government to introduce a measure relating to the Conservancy of Rivers in the present Session, and, if so, whether it would be brought in in that or the other House of Parliament. It was exceedingly necessary for the interests of those concerned that the subject should be fully discussed; he therefore hoped it would be introduced at as early a date as possible.

The Duke of RICHMOND and GORDON: The report to which the noble Marquis alludes is quite correct. The Government have in course of preparation a Bill to deal with this important subject, which, as he is aware, is a very difficult one. I hope, at no distant period, to have the honour of introducing that Bill to your lordships notice.

TUESDAY, FEB. 18.

The following Bills were presented, and read the first time:—Dudley Sewage; Dun Drainage; Llandudno Improvement; Rathfarnham and Terenure Township; West Kent Main Sewerage.

HOUSE OF COMMONS.

MONDAY, FEB. 17.

The petitions were presented for the following Bills, which were ordered to be brought in:—Aire and Calder Navigation, by Mr. Denison and Mr. Stanhope; Aldrington Water, by Mr. Benet-Stanford and Mr. Corbett; Arlecdon and Frizington Water, by Mr. Wyndham, Lord Muncaster, and Mr. Bentinck; Belfast Water, by Mr. Corry and Mr. Ewart; Birmingham Corporation Water, by Mr. Muntz, Mr. Bright, and Mr. Chamberlain; Birmingham Gas, by Mr. Allsop and Sir H. Jackson; Blackburn Improvement, by Mr. Briggs and Mr. Thwaites; Blackpool Extension and Improvement, by Colonel Stanley and Mr. Clifton; Brighton and Hove Gas, by Mr. Gregory and Mr. Scott; Bromley Gas, by Sir C. Mills and Viscount Lewisham; Bury St. Edmund's Gas, by Mr. Greene and Lord F. Hervey; Cardiff Corporation, by Colonel Stuart and Mr. Hussey Vivian; Crystal Palace District Gas, by Colonel Bourne and Dr. Lush; Dearne Valley Water, by Mr. Starkey and Mr. Stanhope; Derby Improvement, by Sir H. Wilmot, Mr. Evans, and Mr. Bass; East Retford Water, by Mr. Foljambe and Mr. William Beckett-Denison; Gaslight and Coke Company, by Colonel Makins and Colonel Beresford; Glasgow Corporation Water, by Dr. Cameron, Mr. Anderson, and Mr. Whitelaw; Glossop Gas, by Mr. Roebuck and Mr. Mundella; Grand Junction Water, by Sir H. Holland and Mr. Coope; Houghton-le-Spring District Gas, by Sir H. Havelock and Mr. Gourley; Ilkley Gas, by Sir M. Wilson and Mr. Ripley; Imperial Continental Gas Association, by Sir Julian Goldsmid and Mr. Twells; Knutsford Light and Water, by Mr. Egerton and Mr. Warburton; Lancaster Gas, by Mr. Starkie and Mr. Knowles; Leicester Corporation, by Mr. Taylor and Mr. M'Arthur; Liverpool Lighting, by Mr. Torr and Mr. Rathbone; London Gaslight, by Sir C. Russell and Mr. Grantham; Lower Thames Valley Main Sewerage Board, by Lord George Hamilton and Mr. Gorst; Mirfield Gas, by Serjeant Simon and Mr. Sanderson; Morecambe Gas, by Mr. Starkie and Mr. Knowles; Nelson Local Board, by Sir U. Kay-Shuttleworth and Mr. Holt; Newcastle-upon-Tyne and Gateshead Gas, by Mr. Cowen and Mr. Hamond; New River Company, by Mr. S. Gathorne Hardy and Sir H. Johnstone; Nottingham Corporation, by Mr. W. E. Denison and Mr. Isaac; Nottingham Water, by Mr. F. Smith and Viscount Galway; Over Darwen Corporation, by Mr. Starkie and Mr. Holt; Pemberton Local Board, by Lord Lindsay and Colonel Blackburne; Plymouth and Stonehouse Gas, by Sir Massey Lopez and Mr. Garnier; Portsmouth Water, by Sir J. Elphinstone and Mr. Bruce; Preston Gas, by Mr. Hermon and Sir J. Holker; Queenstown Gas, by Mr. Goulding and Mr. Murphy; Rawmarsh Local Board, by Mr. Foljambe and Mr. Waddy; Rochester Corporation, by Sir Julian Goldsmid and Mr. Otway; Sleaford Water, by Sir W. Welby-Gregory and Mr. Turner; Southend Water, by Mr. H. Brassey and Mr. Leith; South Shields Gas, by Sir George Elliot and Mr. Ridley; Stourbridge Gas, by Mr. H. Allsopp and Mr. T. Walker; Stratford-upon-Avon Corporation and Local Board of Health, by Sir E. Wilmot and Mr. Repton; Tipton Local Board, by Mr. C. Allsopp, Mr. A. Bass, and Mr. Brogden; Warrington Corporation, by Sir G. Greenall and Mr. Knowles; Weardale and Shildon District Water, by Mr. Pease and Mr. Herschell; Westgate and Birchington Gas and Water, by Mr. J. Cowen and Mr. Ingram; Wisbech Gas, by Mr. Rodwell and Mr. Hicks; Wombwell Local Board, by Mr. Starkey and Mr. Spencer Stanhope.

The Examiners reported that the Standing Orders had not been complied with in the case of the petitions for the following Bills:—Alliance and Dublin Consumers Gas; Colchester Water; Leeds Corporation.

The Chairman of Ways and Means reported—That, in accordance with Standing Order 79, he had conferred with the Chairman of Committees of the House of Lords, for the purpose of determining in which House of Parliament the respective Private Bills should be first considered, and that they had determined that the Bills contained in the following list should originate in the House of Lords, viz.:—Colwyn Bay and Pwllycrochon Estate; Dudley Sewage; Dun Drainage; Llandudno Improvement; Rathfarnham and Terenure Township; Sligo Borough Water; West Kent Main Sewerage.

PREVENTION OF FLOODS.

Mr. ARTHUR PEEL asked the Secretary of State for the Home Department, whether it was the intention of the Government to deal this Session with the question of River Conservancy and the Prevention of Floods; and, if so, whether by a separate measure distinct from the County Boards Bill.

Mr. CROSS said that the Lord President would, before long, introduce in the other House a separate measure dealing with the question.

LANCASHIRE AND YORKSHIRE WATER SUPPLY.

Mr. E. S. HOWARD gave notice that on Tuesday, Feb. 25, he would move —"That an humble address be presented to Her Majesty, praying Her Majesty to issue a Royal Commission to inquire into the supply of water to the manufacturing districts of Lancashire and the west of Yorkshire, and any deficiencies likely to arise therein; and whether it is necessary or expedient to resort to the Westmoreland and Cumberland Lakes to make good any deficiencies in such supply; and, if so, to what extent, and under what conditions, such resort should be sanctioned."

TUESDAY, FEB. 18.

The following Bills were read the first time, and referred to the Examiners:—Aire and Calder Navigation; Bromley Gas; Bury St. Edmund's Gas; Crystal Palace District Gas; Gaslight and Coke Company; Glossop Gas; Ilkley Gas; Imperial Continental Gas Association; Knutsford Light and Water; Lancaster Gas; London Gaslight Company; Mirfield Gas; Morecambe Gas; New River Company; Nottingham Water; Portsmouth Water; Preston Gas; Southend Water; South Shields Gas; Stourbridge Gas; Weardale and Shildon Water; Wisbech Gas.

The following Bills were read the first time, and ordered for second reading:—Aldrington Water; Arlecdon and Frizington Water; Belfast Water; Birmingham Corporation Water; Birmingham Gas; Blackburn Improvement; Blackpool Extension; Cardiff Corporation; Derby Improvement; East Retford Water; Glasgow Corporation Water; Grand Junction Water; Houghton-le-Spring District Gas; Leicester Corporation; Liverpool Lighting; Lower Thames Valley Main Sewerage; Nelson Local Board; Nottingham Corporation; Pemberton Local Board; Rawmarsh Local Board; Rochester Corporation; Sleaford Water; Stratford-upon-Avon Corporation; Tipton Local Board; Warrington Corporation; Westgate and Birchington Gas and Water; Wombwell Local Board.

WEDNESDAY, FEB. 19.

Plymouth and Stonehouse Gas Bill, Newcastle-upon-Tyne and Gateshead Gas Bill,—read the first time, and referred to the Examiners.

Dearne Valley Water Bill,—read the first time, and ordered for second reading.

Petitions against the following Bills were presented:—Bromley Gas, from Bromley District Local Board; Derby Improvement, from (1) Derby Water-Works Company, (2) Derby Gaslight and Coke Company; Houghton-le-Spring District Gas, from Houghton-le-Spring District Local Board; Westgate and Birchington Gas and Water, from Margate and Broadstairs Water-Works Company.

THURSDAY, FEB. 20.

Brighton and Hove Gas Bill,—read the first time, and referred to the Examiners.

Manchester Corporation Water Bill,—petition presented, and Bill ordered to be brought in by Sir Thomas Bazley, Mr. Birley, Mr. Jacob Bright, and Mr. Hardcastle.

A petition against the Over Darwen Corporation Bill was presented from the Governors of the Bolton Free Grammar School.

WATER SUPPLY BILLS.

Mr. ALEXANDER BROWN asked the President of the Local Government Board whether, having regard to the numerous Private Bills which have for their object the supply of water, and which Parliament every Session has to deal with, he proposes to take any steps to carry out the recommendation of the Select Committee which sat last year upon the Public Health Act (1875) Amendment Bill, and especially that one which says that when a Water Company or a Sanitary Authority go to a rural district for water, or when their mains pass through a rural district which is in want of water, they shall be compelled to supply such district on proper terms; and whether, to carry out the views of the Committee, the officers of the Local Government Board will be instructed to present to Parliament reports, to guide the various Committees which will be appointed to consider these Water Bills, as to the wants of the districts from which the water is taken, or through which the water mains will pass.

Mr. SCLATER-BOOTH: Whenever I have the opportunity of introducing a Bill to amend the Public Health Act, I will not fail to give careful consideration to the recommendations of the Committee, and especially to the one referred to in the question. As to the suggested reports, they would necessitate careful local inquiry in every locality to which Water Bills refer, and there is no staff at my disposal adequate to such a duty. In their reports to the Committees on Water Bills, however, the Local Government Board are this year drawing attention to the difficulties in which Sanitary Authorities may be placed by the inclusion of their districts in the limit of supply of a company, unless the company *bonâ fide* intend to afford the district a proper supply; and we suggest that if this intention is not proved, the district should not be included in the Bill. We further point out that if the district is not supplied by the company within a prescribed time, the prior right of the company to supply should cease.

FRIDAY, FEB. 21.

The following resolution, reported from the Standing Orders Committee, was agreed to:—"That, in the case of the Leeds Corporation petition, the Standing Orders ought to be dispensed with: That the parties be permitted to proceed with their Bill." The Bill was then ordered to be brought in by Mr. Wheelhouse, Mr. Tennant, and Mr. Barran.

Petitions against the Brighton and Hove Gas Bill were presented from (1) Corporation of Brighton, (2) Shoreham Harbour Trustees.

Legal Intelligence.

HIGH COURT OF JUSTICE—QUEEN'S BENCH DIVISION.

MONDAY, FEB. 17.

(*Sittings in Banco, before the* LORD CHIEF JUSTICE *and Baron* POLLOCK.)

THE SOUTHWARK AND VAUXHALL WATER COMPANY *v.* QUICK.

This was an action by the Company against their Engineer (and his son as his partner) to recover a very large sum, on the score of alleged overcharges. The case was tried at great length in the December sittings, before Lord Coleridge, when the Company failed entirely as to the son, and also failed as to the father, except about £212, as to which a question arose which the Judge left to the jury, and on which they found in his favour. Thereupon Lord Coleridge gave judgment for the son; but as to the father he gave no judgment, and simply left the parties to move for judgment—directing, at the same time, that if the Court should direct judgment to be entered for the defendant, he should pay no costs to the Company, and they should pay half his costs. The defendant now found he could not contest the claim for £212, and he desired to assent to judgment to that effect, but also to have the benefit of Lord Coleridge's order as to costs.

The SOLICITOR-GENERAL, Mr. MARRIOTT, Q.C., and Mr. TENNENT were for the Company; Sir H. JAMES, Q.C., Mr. W. WILLIAMS, Q.C., and Mr. J. C. MATHEW for the defendant.

On the case being called on,

Sir H. JAMES said he assented to judgment against him for £212.

The SOLICITOR-GENERAL desired to have an order made in accordance with Lord Coleridge's order as to costs.

After a long technical discussion, judgment was entered for the Company for £212, and for the defendant for £83 on a counter-claim; but no order was made as to costs.

YORKSHIRE WEST RIDING ASSIZES, LEEDS.

WEDNESDAY, FEB. 5.

(*Before Lord Justice* BRETT.)

NEWBIGGIN GAS COMPANY, LIMITED, *v.* MOFFETT.

This was an action against the late Secretary of this Company, to recover from him a seal, a register of shareholders, minute-book, and other documents, besides moneys received by him as collector for the plaintiffs.

Mr. WILLS, Q.C., and Mr. FORBES appeared for the plaintiffs; Mr. CAVE, Q.C., and Mr. JOHN EDGE for the defendant.

Mr. WILLS said this was one of the oddest quarrels he had ever been

engaged in. The Gas Company was formed a few years ago, to supply a small place on the banks of the Tyne, and for a time had carried on business in a rather irregular manner; but on the 25th of September, 1875, five new Directors were appointed, after which some difficulties arose about a mortgage of £500 already existing, and about obtaining further advances, and at a meeting held in 1877 the defendant was not present, and declined to produce books and papers. He thought he had discovered a flaw in the appointment of the new Directors, forgetting that there was a clause in the Act of Parliament, which declared that any apparent informality or error in the election of Directors should be valid notwithstanding. The consequence of the defendant's conduct was that Shareholders who wished to transfer their shares could not effect the usual registration; and this action was, therefore, rendered absolutely necessary. A meeting was held at Newcastle, with the intention of overriding the proceedings of the original Directors; but a meeting of the other parties was held after that, at Huddersfield, and that meeting reversed what had been done at Newcastle. The result was that matters came to a deadlock.

The JUDGE said he could not sit to try which was the right set of Directors, and he advised that the parties should state a case for the decision of the Court above.

This was agreed to, and a nominal verdict taken for the plaintiffs.

ACCRINGTON PETTY SESSIONS.—THURSDAY, FEB. 6.

(*Before Messrs.* G. WALMSLEY, F. A. GATTY, J. S. GRIMSHAW, *and* W. WILKINSON.)

TAMPERING WITH A GAS-METER.

James Hutchinson, a second-hand clothes dealer, was summoned by the Accrington Gas and Water Company for interfering with their pipes and fraudulently extracting gas.

Mr. EASTHAM appeared for the Company, and Mr. BARLOW for the defendant.

Mr. EASTHAM said the defendant entered a house between the June and September quarters of last year. He did not give the usual notice to the Company when he entered, but he was in the place in September. The inspector of meters was going round on the 3rd of January, dressed in the usual livery. When he came to defendant's house, defendant's wife cried out, "The gas man!" The defendant appeared to be greatly fluttered, and the inspector went down into the cellar to inspect the meter. He found that the inlet and outlet pipes had been disconnected, and that a short piece of service-pipe had been inserted at the top of the meter, so that the gas could be consumed without going through the meter. The inspector asked who had been interfering with the meter, and the defendant muttered something, but the inspector could not tell what it was. The inspector then told him that he had rendered himself liable to a penalty of £5. The inspector went for a Mr. Smalley, and on their return to the house, the short piece of pipe had vanished, and the inlet and outlet pipes had been thrust very hurriedly into the meter. They were not properly jointed. The inspector again asked the defendant who had disconnected the pipe from the meter, but he received no reply. The case was reported to the Secretary of the Company (Mr. C. Harrison), who wrote a letter to the defendant, pointing out the seriousness of the offence, and telling him that he was liable to a penalty of £5, and £2 a day whilst the pipes were disconnected. The case was brought under the 25th clause of the Accrington Gas and Water Works Company's Act, 1869. This was one of those cases which required to be marked with a heavy penalty. If he proved the facts he had related, he thought the Bench would conclude that it was a very serious case.

Evidence was then given in support of the above statement.

Mr. BARLOW addressed the Bench for the defence. He said he did not think it was so serious an offence as had been represented. The Company could have inspected the meter as often as they pleased. That the pipes were disconnected was not denied, but the defendant could not tell how it had been done.

The CHAIRMAN said there was not the slightest doubt that the defendant had been attempting to defraud the Company, and the Bench considered that a serious offence. If half their customers did as the defendant had been doing, the Company would soon be ruined. They would inflict a fine of 50s, and if another case of a similar character came before them, they would inflict the full penalty.

WESTMINSTER COUNTY COURT.—WEDNESDAY, FEB. 12.

(*Before Mr.* F. BAYLEY, *Judge.*)

LONDON GASLIGHT COMPANY *v.* GRANTHAM.

This was an action to recover £10, for damage done to the Company's pipes, and the loss of gas consequent thereon, caused by the alleged negligence of the defendant's servants. The defendant is a sub-contractor, of Warwick Street, Pimlico, and was engaged to excavate some building land, of about 30 yards frontage, on the Thames Embankment. By some accident, either by carts passing over them, or by their being struck with a pick, the main and some service-pipes were broken, and a large quantity of gas escaped before the attention of the Company's officials could be called to it.

Defendant did not deny that his men or carts caused the damage, but urged that it was purely an accident, caused by the rotten and saturated state of the ground.

After hearing some further evidence, his HONOUR gave judgment for the amount claimed, with costs.

MANSION HOUSE POLICE COURT.—WEDNESDAY, FEB. 12.

(*Before the* LORD MAYOR.)

THE METROPOLITAN PURE WATER SUPPLY ASSOCIATION.

James W. Parker was charged with obtaining money by false pretences in connection with an Association called the Metropolitan Pure Water Supply Association, Limited.

Upon a previous examination it was alleged that the prisoner had for years past been collecting money for the object in question, representing to those upon whom he called the desirability of obtaining a constant and pure supply of water for the Metropolis, and stating that subscriptions were needed to defray the expenses incurred in making application to Parliament, and obtaining an Act. He mentioned the names of Professor Fawcett, M.P., and Mr. W. E. Forster, M.P., as those of some of the members supporting the project. On this plea he obtained a subscription of £2 2s. from Mr. Ernest Schüster, a merchant at 90, Cannon Street, and other moneys from various firms. The whole affair was said to be a fraud, and its exposure was due to the Charity Organization Society. At this examination a letter was read from Professor Fawcett, repudiating any connection with the Association in question. It was stated that the Professor would be called as a witness to that effect on a future occasion.

Mr. *Samuel Hayman*, a clerk in the Registry of Joint-Stock Companies, deposed that the Metropolitan Pure Water Supply Association, Limited, was registered there in February, 1867, and that he had frequently seen the prisoner at the office, in connection with the Company. The first offices were at 2, Bream's Buildings, Chancery Lane; next at 18, King's Arms Yard; then at 96, Warner Road, Lambeth; and at present at the City Chambers, Railway Place, Fenchurch Street. These changes of address were all signed by the prisoner. No official notice had been given of any offices in Great or Little Queen Street, Westminster, in Norton Folgate, or in Great College Street.

Mr. *Joseph Tritton*, a member of the firm of Barclay, Bevan, and Co., bankers, Lombard Street, recognized the prisoner as having solicited a donation from him for what he called the benevolent project of ensuring a constant supply of pure water throughout the Metropolis. He gave him two guineas in July, 1877, and his firm contributed five guineas on Jan. 16, 1878. From what he heard afterwards, he communicated with the Charity Organization Society, and gave the prisoner into custody.

It was next proved that Messrs. Antony Gibbs and Sons, merchants, 15, Bishopsgate Street Within, gave the prisoner a donation of five guineas in July, 1877, and another of equal amount in March last.

A clerk from the Temple Bar Branch of the Union Bank of London spoke to the Association keeping an account there from May, 1868, till March, 1870, and said the average maximum balance was £10 or £15, which was always drawn out as soon as it was paid in.

It was further proved that the Association never had offices at either 4, Great Queen Street, Westminster, or 3, Little Queen Street, as the prisoner had represented.

The prisoner was remanded until the following Thursday, when, furtner evidence having been given, he was committed for trial at the Central Criminal Court.

ASHTON BOROUGH POLICE COURT.—MONDAY, FEB. 10.

(*Before Mr.* T. J. LANCASHIRE.)

AN UNPAID GAS ACCOUNT.

Mr. *Shakespeare Shaw*, carrying on business as a cotton spinner and manufacturer, under the style of the Egret Mill Company, was summoned by the Aston Gas Company for £58 11s. 7d. for gas consumed. Defendant did not appear, and was not represented.

Mr. BUCKLEY, who appeared for the Gas Company, stated that the proceedings were taken under the Gas-Works Clauses Amendment Act, 1871 which empowered a company in certain cases to recover by distress any rents which might be in arrears to them. The 23rd section of the Act provided that if any person neglected or refused to pay the amount due for the gas consumed, a justice might issue a summons to such person, requiring him to appear, and in case he did not appear after proof of the service of the summons, and if sufficient cause was shown, might issue a warrant of distress upon his goods and chattels for the amount due. The defendant had been carrying on business under the name of the Egret Mill Company, and had been applied to several times for the amount he owed to the Gas Company, which was £58 11s. 7d. He (Mr. Buckley) proposed to prove that he had consumed gas to that amount, and that application had been made to him several times for payment, and he should then have to ask for a warrant of distress to issue immediately, as it was quite evident to the Company that the amount would have been paid unless the defendant was in such a position as to render it necessary to take these proceedings against him.

Inspector BAMFORTH stated that he served the defendant with the summons. He said, on learning what it was for, that he must consult his Solicitor before paying, though he dared say the Company would be paid along with all the rest.

The amount of gas consumed since the end of the September quarter was proved, and the correctness of the account certified by various persons in the employ of the Gas Company.

Mr. LANCASHIRE then granted the warrant of distress, adding, at the request of Mr. Buckley, that it would issue immediately.

STEALING GAS.—At Glasgow, on Saturday, the 1st inst., a man named Patrick Macdonald, was sentenced to twenty days imprisonment for stealing one cubic foot of gas, the property of the Corporation. He had been using the gas from a connection with the pipe before it reached the meter in his house in Maitland Street.

Miscellaneous News.

METROPOLIS WATER SUPPLY.

The Registrar-General publishes the following report on the average daily quantity of water supplied to London during January, 1879. According to the returns furnished to him by the Metropolitan Water Companies, 137,099,189 gallons, or 622,904 cubic mètres, of water (equal to about as many *tuns* by measure, *tons* by weight) were supplied daily, or 246 gallons (111·8 decalitres), rather less than a *ton* by weight, to each house, and 34·7 gallons (15·8 decalitres) to each person, against 30·6 gallons during January, 1878.

Companies.	Number of Houses, &c., supplied in Jan, 1878.	Jan., 1879.	Aver. Daily Supply of Water in Gallons* during Jan., 1878.	Jan., 1879.
Total supply	541,265	556,513	117,475,799	137,099,189
From Thames	254,512	262,632	58,480,063	66,385,239
„ Lea and other Sources	286,753	293,881	58,995,736	70,713,950
THAMES.				
Chelsea	28,859	29,562	7,439,200	7,642,200
West Middlesex	50,200	51,571	8,986,942	10,070,414
Southwark and Vauxhall	79,567	82,289	18,100,000	23,852,888
Grand Junction	37,910	38,989	11,012,121	11,400,537
Lambeth	57,976	60,221	12,941,800	13,419,200
LEA AND OTHER SOURCES.				
New River	126,178	127,867	26,198,000	27,474,000
East London	115,143	118,910	26,033,800	34,584,700
Kent	45,432	47,104	6,763,936	8,655,250

* Including that for manufactures and for various purposes other than for domestic consumption.

Note.—The return for Jan., 1879, as compared with that for the corresponding month of 1878, shows an increase of 15,248 houses, and of 19,623,390 gallons of water supplied daily.

The following is Dr. Frankland's report on his analyses of the Metropolitan Water Supply during January, 1879:—

"Taking the average amount of organic impurity contained in a given volume of the Kent Company's water during the nine years ending December, 1876, as unity, the proportional amount contained in an equal volume of water supplied by each of the Metropolitan Companies, and by the Tottenham Local Board, was:—Tottenham, 1·1; Colne Valley, 1·3; Kent, 1·7; Chelsea, 3·8; New River, 4·4; East London, 4·4; Lambeth, 4·7; Southwark, 5·1; Grand Junction, 7·8; West Middlesex, 8·2. The water taken from the Thames by the West Middlesex, Southwark, Grand Junction, and Lambeth Companies was much polluted by organic matter, and that delivered by the Grand Junction Company was again inefficiently

filtered. The Chelsea Company's water, though turbid and milky, from inefficient filtration, contained the smallest proportion of organic matter of any water supplied from the Thames. On the other hand, the West Middlesex Company's water, although efficiently filtered, contained a very large proportion of organic matter—nearly eight times as much as that found in the water supplied by the Tottenham Local Board of Health. The water drawn from the Lea by the New River and East London Companies was efficiently filtered, but it was much contaminated with organic matter. The water delivered by the Kent and Colne Valley Companies, and by the Tottenham Board of Health, was clear, and of its usual excellent quality for dietetic purposes. The Colne Valley water was soft, and, therefore, fit for washing. The river waters were delivered at a temperature but slightly removed from the freezing point; they were therefore very liable to freeze in the service-pipes and cisterns; but the Kent Company's water from deep wells maintained its usual average temperature, and was 11·3° Cent. (20·3° Fahr.) above the freezing point, when drawn from the service-pipe at Deptford. Seen through a stratum two feet deep, the waters presented the following appearances:—Kent, Colne Valley, and Tottenham, clear and colourless; Chelsea, turbid, milky pale yellow; Southwark, Lambeth, New River, and East London, clear and pale yellow; Grand Junction, slightly turbid, milky yellow; West Middlesex, clear and yellow."

Results of Analyses expressed in Parts per 100,000.

Companies or Local Authorities.	Total Solid Matters.	Organic Carbon.	Organic Nitrogen.	Ammonia.	Nitrogen, as Nitrates and Nitrites.	Total combined Nitrogen.	Chlorine.	Total Hardness.
Inner Circle.								
Thames—								
Chelsea	30·30	·188	·038	·004	·150	·193	1·6	19·7
West Middlesex	28·92	·441	·042	0	·214	·256	1·5	18·8
Southwark	33·40	·259	·040	0	·183	·223	1·5	22·4
Grand Junction	28·68	·408	·053	0	·201	·254	1·5	18·6
Lambeth	34·54	·234	·043	0	·314	·357	1·6	23·6
Other Sources—								
New River	31·86	·221	·040	0	·307	·347	1·5	21·5
East London	35·87	·220	·042	·008	·306	·354	1·7	24·8
Kent	45·62	·085	·016	0	·420	·436	2·4	29·4
Outer Circle.								
Colne Valley	13·16	·063	·017	·003	·339	·358	1·4	7·6
Tottenham Local Board	48·86	·049	·017	0	·549	·566	3·3	35·0
Corporation of Birmingham*	24·24	·187	·058	·007	·275	·339	1·6	15·9
Corporation of Glasgow†	3·00	·152	·011	0	·007	·018	0·60	1·43

* Analyzed by Dr. Alfred Hill, Medical Officer of Health and Analyst to the Borough.
† Analyzed by Dr. E. J. Mills, F.R.S., of Anderson's College, Glasgow.

Note.—The numbers in the analytical table can be converted into grains per imperial gallon by multiplying them by seven, and then moving the decimal point one place to the left. The same operation transforms the hardness in the table into degrees of hardness on Clark's scale.

LIVERPOOL UNITED GAS COMPANY.

The Half-Yearly General Meeting of this Company was held on Tuesday, the 18th inst.—Mr. D. O. Bateson (the Chairman) presiding.

The Secretary (Mr. P. F. Garnett) read the notice convening the meeting, and the following report of the Directors:—

The Directors having caused to be prepared and submitted to them an estimate of the profits of the Company for the half year ending the 31st of December last, in accordance with the Company's Acts of Parliament, and having duly considered the same, recommend the Proprietors to declare a dividend for the half year, ending as above stated, of £5 on every £100 of the ordinary consolidated stock, and at the rate of £3 10s. for every £100 on the consolidated B (7 per cent.) stock, and on the capital paid up in respect of the new £7 10s. shares.

The Proprietors will be glad to learn that the claim of the Mersey Docks and Harbour Board, arising from the burning of the landing-stage, has been finally settled by amicable adjustment; and, although the total amount paid by this Company (£89,767 6s. 5d.) is very large, yet it is much less than the sum which was claimed by the Dock Board, irrespective of the heavy expenses which would have attended a protracted arbitration.

The Directors viewed with much regret the temporary depreciation which occurred a few months ago in the selling value of the Company's stock, the result of an unreasonable panic caused by a revival of the project for introducing the electric light as a substitute for gas. It is satisfactory, however, to remark, that the depression in price was of very short duration, and that the market value of the stock and shares has already greatly rallied, and now approaches its normal rate. The apprehension felt by some of the Shareholders may possibly have been aggravated by the action of the Corporation of Liverpool in promoting a Bill for enabling them to supply electric light within the borough. This Bill it will be the duty of the Directors strenuously to oppose, if the ratepayers should sanction the further progress of a measure authorizing the expenditure of the corporate funds on a scheme of such speculative and experimental character.

The Proprietors are aware that, by an Act of Parliament passed in the year 1865, the Corporation of Liverpool are authorized to have the gas tested (at three hours notice) by a competent person appointed by themselves, by means of apparatus constructed at the expense of the Company, and kept under the joint custody of the Corporation and the Company. Although statements have been repeatedly made in the Town Council, during several years past, of alleged deficiency in the illuminating power of the gas, yet it was not until last year that the Corporation resorted to the means prescribed by the Act, for ascertaining whether the complaints were well founded. In the month of June last, the gas was, for the first time, tested by the official tester nominated by the Town Council, and was pronounced to be considerably above the prescribed standard of illuminating power. This result cannot but be regarded as a very satisfactory refutation of the allegations above alluded to, and as confirmatory of the assurances which have always been given by the Directors, that the standard of illuminating power is most carefully maintained.

The Chairman, in moving the adoption of the report, said that the past year had been one of rather unusual incident in the ordinarily quiet and unobtrusive career of the Company. As the Proprietors were aware, no balance-sheet was produced at this time of the year, the accounts being made up annually in August; but the Directors had looked narrowly into all the figures, and had satisfied themselves that everything was going on right, and that the statutory dividend had been earned for the past half year. They would be prepared, therefore, to pay it on the 21st inst., and he ventured to say the Proprietors would have no objection to that course of proceeding. The accounts of the Company for 1877-78 had been examined by Mr. M'Quie. Mr. M'Quie was appointed by the Recorder for that purpose, and, of course, he must justify his appointment by criticizing the accounts to a certain extent. His criticisms went to the effect that the Directors placed certain sums to revenue which ought to go to capital. Now, they knew very well that the line of demarcation between capital and revenue was very difficult to define; but he thought all those Proprietors who were in business would agree with him that it was the part of a prudent trader to place as many of his expenses as he could to revenue. However that might be, the accounts were kept in the same way that they had been ever since the Company was a company; and, until their proceedings were called in question by some more competent authority, the Directors intended to continue in the same course. As he had said, the last half year had been one of unusual incident. The first thing that gave them cause for anxiety was the settlement of the unfortunate claim about the burning of the landing-stage. It would be remembered that when the trial went against the Company, the Directors, in order to avoid further litigation, made arrangements with the Dock Board to pay two-thirds of the cost of replacing the stage in the exact position in which it was at the time of the burning, and the Dock Board furnished them with a kind of rough estimate that the cost of this would be about £180,000. Thus, they expected to have escaped with the payment of between £85,000 and £90,000; for, of course, it was generally assumed that, when an estimate of that kind was given, everything possible had been put into it, and that it would, at all events, be the maximum. Their consternation, therefore, could be imagined when the bill came in, and was found to be £163,000, involving an expense to the Company of something like £110,000. Of course they resisted this, and, after considerable negotiation, the matter was about to be put into the hands of the Arbitrator—it having been provided that there should be arbitration—when it apparently came to the knowledge of the Dock Board that the Directors had discovered some very gross and egregious errors in the account. This seemed to have made the Board rather more anxious to arrive at a settlement without the matter coming before the public, and they invited the Directors to make an offer. After great consideration, the Directors made them an offer of £87,500 to close the account in full. This offer the Dock Board accepted, and the Directors paid the money, looking as pleasant as they could, and thus wiped out a very disagreeable episode in the existence of the Company. It was quite possible that they might have got off for rather less money if they had gone to arbitration; but it was very difficult to say how the Arbitrator might have viewed some particular points on which they relied, and his decision might have gone quite the other way. He thought, therefore, they had not done so very badly in getting something like 20 per cent. taken off the original account. He should like the Shareholders to know that they were mainly indebted for this arrangement to Mr. Morris. It was to that gentleman's extraordinary aptitude for figures, and his great experience and talent in checking estimates and quantities, added to his tenacity in holding on to his points when once they were made, that a fair and satisfactory settlement of a very unsatisfactory business had been arrived at. Well, they were hardly out of this business when the scare in gas shares occurred, mainly caused by reports of Mr. Edison's inventions and improvements in the electric light. Some of them had often before been deceived by sensational telegrams from America, and had lost their money in consequence. He was glad, however, to think that the main body of the Shareholders had held on bravely to their stock, though some few timid ones had sold their property at a sacrifice during the recent panic. It was some consolation to know that a large number of the more far-seeing Shareholders had increased their holdings, and that the proprietary had been strengthened by the acquisition of several new and very substantial additions. He was not at all prepared to deny that the electric light, as an illuminator, was a most brilliant one, and that it eventually might be useful for lighting railway-stations and large areas, and possibly some workshops, where expense was no object; but the prospect of its use for street lighting generally, or for house lighting at all, was, he thought, exceedingly remote. Some experiments had been ordered by the Town Council, and the Borough Engineer reported that, as compared with the electric light in Paris, gas of the same illuminating power cost one-sixth; and the Governor of The Gaslight and Coke Company, the other day, said that electricity cost four times as much as gas. So that, on the point of cost, they could beat the new comer out of the field. Besides, they had heating, cooking, engine-driving, and a variety of other matters, for which electricity was not available at all, to fall back upon, if gas lighting failed them. Their Engineer (Mr. King) and himself were in London last week, making a survey of the different experiments that were being made there. The Thames Embankment and the Holborn Viaduct were lighted by electricity, whilst Waterloo Road, from Waterloo Bridge up to the station, and the lower part of Regent Street and Piccadilly Circus, were lighted by gas-lamps with Argand burners. The whole was exceedingly well done, and a great improvement on the old system. He might be, in some measure, prejudiced, but he would decidedly give the preference to Regent Street, the lighting of which was most brilliant. Indeed, he could read a letter without difficulty all down that street; whereas the electric lighting showed considerable fluctuation and flickering, sometimes to the extent of from 25 to 50 per cent. He and Mr. King, therefore, came back perfectly satisfied with the prospects of gas. With these remarks, he begged to move that the report be received and adopted.

Mr. E. Lawrence seconded the motion. He said he should have contented himself with simply seconding the motion, and saying nothing further; but he thought there were times when it was right that, not only the Shareholders of a Company like this, but the public at large, should feel satisfied that the affairs of the Company were administered in a right and proper manner. They had a right to know this; and, at a time when charges against the Company were freely bandied about in the public prints, it was natural, he thought, that they should expect something to be said in vindication of the course which the Directors had pursued. He should not have thought it necessary to refer to charges which had been made thus publicly, had it not been that they had been renewed in such a very specific form during the course of the past half year. It was hardly right that charges which had been answered in days gone by should be again put forward, and the replies which had been made to them ignored, without something being said to satisfy the Shareholders and the public that there was no ground whatever for them. The charges varied in nature, and he would first take one that especially applied to the contract which existed between the Gas Company and the Corporation. It was very boldly asserted in the month of October, in an article in one of the Liverpool daily papers, that the Company had been overcharging the Corporation for gas supplied to the public lamps, and that through the action of Dr. Cross's Committee, this "fraud"—that was the word used—had been put a stop to. If there was any ground for that charge as affecting the Directors of the Company, then all he had to say was that they were not fit to be Directors of the Company any longer, if they could occupy their places and deliberately sanction a fraud upon the Public Authorities of Liverpool; and, on the other hand, if there had been any fraud committed by the Officers of the Company, then they were not fit for the posts they held. But he thought he could show, in a very few words, that no fraud had been committed either by the Company or their Officers, and that the charge was without a shadow of foundation. He had not one word to say in reference to the action of the Corporation in appointing what had been called Dr. Cross's Committee. The Corporation were within their right in appointing a Committee to look after their interests, and the public would think them perfectly justified in doing so. With reference to the charge to which he had alluded, it was based on the report of the Borough Engineer to Dr. Cross's Committee. That Committee was appointed in November, 1874, and in January, 1875, the Borough Engineer made a report to the Committee, which had reference to the gas supplied to the public street-lamps, and on that report, he assumed, this charge was based. This report of the Borough Engineer apparently went to prove that the Gas Company were not supplying the Corporation with the quantity of gas in the street-lamps, which they were bound

to do under their contract. That contract provided that they should supply gas at the rate of 4 cubic feet per hour to each lamp, whilst the Borough Engineer's report went to prove that the lamps which had been tested by him showed that only somewhere about 3½ feet had been supplied. This revelation was so startling in its character that the attention of the Company's Engineer was at once drawn to it, and he found, upon examining the very figures which had been worked out by the Corporation, that an error had been made, and that, even with reference to the 10 lamps that had been examined, the result showed a supply, not of 3½ feet, but of over 3¾ feet. The Engineer was so satisfied, however, that it was a manifest injustice to take 10 lamps out of 7000 or 8000, and base a general conclusion upon the testing of them, that it was decided that further tests should be made; and, under the joint action of the Borough Engineer and the Company's Engineer, further experiments were made, with the view of ascertaining the actual facts of the case. On March 2, 1875, 24 lamps were tested, which showed a result of 4·128 feet; on the 4th of March, 35 lamps were tested, showing a result of 4·244 feet; and on the 9th of March, 40 lamps were tested, showing a result of 4·109—the result, in every case, being considerably above the requirements of the Company's contract. This was considered so completely to set the matter at rest, that no further action had been taken by the Corporation in requiring tests, and it must, therefore, be assumed that they were then thoroughly satisfied, and that this charge had been disposed of. Now, he did think it most unfair that, after such an answer had been given to the charge, it should have been made in such a specific form, and that the Company should have been deliberately charged with a fraud upon the Corporation. To show the candour and good faith which characterized the charge, he would call their attention to an article which appeared in the same paper in March, 1875, after the charges had been first made, and after the experiments to test them had been carried out. The writer of the article said: "As these tests were conducted jointly by the Corporation and the Gas Company, they appear to set at rest the question of fulfilment of contract, and to justify the Company's assertion that the obligations imposed on the Company, both by Act of Parliament and by contract with the Corporation, have been fairly and honestly discharged." That was the decision come to by the same paper that, in the month of November, 1878, thought fit to charge the Company with fraud. He had not thought it right that that charge should go unchallenged, and he thought the evidence he had placed before them—not only of the tests that had been made, but of the paper's own admission at the time those tests were made—ought to set this question at rest at once and for ever. The next charges affected the position of the Gas Company as a supplier of gas, not only to the Corporation, but to the public at large, and they had special reference to the purity and the quality of the gas, both of which had been called in question. There was some little difficulty in knowing, from the vagueness with which the charges were made, whether there might or might not be some confusion in the minds of the persons making them, as to what was understood by purity and quality; but he would deal with both questions. The question of purity referred to the deleterious ingredients that were to be found in the gas; and the question of quality referred to the illuminating power. Now, with regard to the question of purity, he must assume, as the charge was made, that it referred to the deleterious ingredients. One of the charges made in October last, in the paper he had referred to, was that the Gas Company had supplied gas below, as it was there termed, the legal standard of purity, but that, owing to the action of Dr. Cross, this had been put straight. He ventured to say, on behalf of the Directors, that there was not one word of truth in this. From whatever cause it proceeded, he could not tell; but he could not believe that the Editor of any paper would deliberately state what he knew to be untrue. He (Mr. Lawrence) could only conclude that he had been misinformed, and had, consequently, made a charge which would not bear examination. The question of the purity of the gas must be set at rest by the report of Dr. Cameron, of Dublin, the Analyst recently employed by the Corporation for the purpose of testing both the purity and the illuminating power of the gas, who said, in his report, that the most serious impurity found in coal gas was sulphuretted hydrogen, and this he failed to find, even in the slightest quantity, in the Liverpool gas. He (Mr. Lawrence) might say further, that the Company challenged comparison of their gas, as regarded purity, with the gas produced in any other town in England. Then, with regard to the quality and illuminating power of the gas. They had been told on the same authority—in fact, on the authority of a gentleman in the Council, who was deservedly highly respected in the town, Mr. Edward Whitley—that, owing to the action of Dr. Cross's Committee, the illuminating power of the gas of Liverpool had been improved. He did not know how Mr. Whitley arrived at his facts, but he could only say to the Proprietors and to the public that Mr. Whitley had been entirely misled in coming to the conclusion he appeared to have come to in the matter. Dr. Cameron, who was specially brought to Liverpool to test the illuminating power of the gas, and who went into the question most carefully, after making allowance for certain disturbing effects, said: "The gas, burning at the rate of 5 cubic feet per hour, evolved a quantity of light equal to that produced by the consumption of 23·675 sperm candles per hour." What could be a clearer reply? It might be said that Dr. Cameron tested the gas at a particular time, and that the charges which were made applied to some other time. Well, it was in the power of the Corporation to test the gas whenever they thought fit, by giving the Company three hours notice. But the Company themselves were constantly testing the gas, because they knew that they were bound to give to the consumers of Liverpool, gas of a certain quality, and it was their interest and their desire not only to do so, but to give them a little better than they were bound to give. A record was kept of what the Company were doing; and, going back to a period before Dr. Cross's Committee came into operation, that record showed that the average illuminating power of the gas in 1871 was 21·29; in 1872, it was 21·59; in 1873, 21·18; in 1874, 21·73; in 1875, 21·59; in 1876, 21·53; in 1877, 21·53; and in 1878, 21·41 candles. Could there be a more complete answer to the charge of a want of illuminating power than was contained in those figures? These were yearly averages; but he would go farther, and say that if they took the actual experiments each month, or if they would go still farther and take the actual experiments for each day—for the gas was tested six times a day—the result was precisely the same. He believed he was correct in saying that, on three occasions only, during those tests, made every day during those periods of years, had it ever been found that the illuminating power of their gas was the shadow of a fraction below 20 candles, and he believed that, on those three occasions, it was about one-eighth to a quarter of a candle below. On one occasion it arose from the fact that some of the mains were being repaired, and some air had found its way into them, and naturally produced a little depreciation in the quality of the gas for an hour or an hour and a half; and on the other two occasions it was impossible to say how it had arisen, but it only affected the quality of the gas for about the same period. If, in the face of that, any gentlemen could still say that the Liverpool Gaslight Company failed to carry out their Act of Parliament, and to keep faith with the public of Liverpool and the gas consumers, then he was at a loss to understand on what ground they based their conclusion. If the Corporation were still disposed to question the facts, they could call in their Analyst every hour of the day, if they pleased; and the Directors were satisfied that the results would be always the same. The Directors instructed their officials to keep the gas up to 21¾ candles, in order that it might not possibly be below the standard; so that their policy was to put the Shareholders to greater expense than they were actually bound to, in order that they might, to the fullest extent, keep faith with the public; and, under these circumstances, he thought it was not fair that an important public company like the Gas Company should be treated as they had been by certain sections of the people of Liverpool. He hoped that, after the explanation which he had made, and which had been made in thorough good faith, and with a sincere desire to satisfy the public that the Directors were doing what was right by them, they would not be charged with conduct of which they would be ashamed, and with acts which they had never committed. Great credit had been claimed for Dr. Cross's Committee, for having procured an alteration in the deposit system. Well, he was quite willing to allow that the public agitation of this matter had led to an alteration. The Directors were perfectly frank in the matter, and were willing to admit that such was the case. It was very natural that a system, which was based upon sound and correct views, might, at times, be attended with difficulties, and perhaps in cases with annoyance, which required looking into. The Directors were only too glad to have such cases brought under their notice, and to take care that they were rectified; and the alterations which had been made in reference to the deposit system had, he trusted, obviated all the little annoyances which had arisen. The system itself, however, was a thoroughly sound one, and one which it was utterly impossible that, either in the interests of the public or of the Shareholders, they should abandon. When he told them that the bad debts of the Company amounted to no more than from one-eighth to one-sixth per cent. on their total receipts of £350,000 in the course of the year, they must see that it was a most important thing for the Shareholders, and for the public as well, that the Company must keep up a system which protected them so efficiently. Then, the officials had been charged with arrogance. He should be sorry to say that such charges were utterly without foundation—he would not do those who made them the injustice of saying so; but the public must know that there was no wish on the part of the Directors, or of the leading officials, that there should be anything but the utmost civility shown to any one who had business to transact with the Company; and if there did arise any cause of complaint, they were only too glad that it should be brought under their notice, and only too ready and anxious to take care that it did not occur in the future. In conclusion, he thought the Gas Company had a right to take some little credit to themselves for the way in which Liverpool had been furnished with gas. The town had been supplied with an article which he had shown was of a higher quality even than the Company were obliged to provide; and the Company had provided it, at times, at very great cost, and under circumstances of very great difficulty, arising from strikes, frosts, blocks on railways, and other things of which the public were not aware. Under all these difficulties the Company had not failed to keep the town well and efficiently provided with an article which was above the quality required; and he did not know that he could do better than close his remarks by quoting the last paragraph in Dr. Cameron's report, in which he said: "In conclusion, I cannot avoid congratulating the citizens of Liverpool with respect to the excellent quality and illuminating power of the gas."

Mr. T. Cope, referring to the remarks of the Chairman that, should electric lighting become more general, there was a grand field for the Company in providing gas for heating and cooking purposes, and for driving engines, suggested that they should take Time by the forelock, and occupy that field before they were driven into a corner. He was sure that cheap gas provided in the neighbourhood of the Docks, for working hoisting apparatus, would be an immense boon to the commercial community. He thought also some improvement might be made in the lamps and burners.

The Chairman replied that if they provided cheaper gas for the purposes referred to, it would involve new mains being laid all through the town.

Mr. J. G. Morris said that they had no power to make a second quality of gas.

Mr. Cope said The Gaslight and Coke Company were applying for those powers.

The Chairman said he was not aware that that was the case. With regard to lamps and burners, they had ordered a few lamps and burners of different illuminating powers, and intended to experiment with them. At present they thought the old batswing burner the best of all. The Argand burner, although furnishing a great deal of light, involved a chimney, which was a constant source of annoyance and expense; but there was no reason at all why gentlemen should not have any burners they pleased.

The report was then adopted unanimously.

The Chairman next moved the declaration of the dividend recommended in the report.

Mr. Lawrence, in seconding the motion, said that he particularly wished to state, in order to reassure the minds of the Shareholders on the subject of electricity, that, supposing the whole town of Liverpool were lighted with electricity instead of with gas, it would only affect the revenue of the Company to the extent of about £24,000 a year, out of £350,000; so that it would not be a very serious matter to them.

The motion having been carried unanimously, thanks were voted to the Chairman and Directors.

The Chairman, in responding, said the Directors would continue in their usual course of providing the public—a very ungrateful public, he was afraid—with as good an article as they possibly could, at the very lowest price compatible with the Proprietors receiving their dividends with the utmost regularity.

The proceedings then terminated.

Airedale Gas Company.—The half-yearly meeting of this Company was held on Monday, the 10th inst., at the Company's offices, Idle, near Leeds. Mr. Robert Sutcliffe occupied the chair, and, in moving the adoption of the report, said that the Company had earned and paid a dividend at the rate of 10 per cent. per annum for the past 20 years, and he did not see that they need fear being quite as prosperous in the future as they had been in the past. As to the electric light, he was not, neither had he ever been, in the least afraid of it, so far as competition in price was concerned. Fossil fuel had to be converted into motion, and the motion converted from the steam-engine into dynamic electricity. Now, it was a well-known and admitted fact that the most perfect steam-engine did not utilize one-tenth part of the potential energy stored up in the fuel which was required to set it in motion. Then, take the conversion of motion into light, and it would be perceived at once that the process offered insuperable difficulties, which, to be successfully overcome, would involve a reversal of the laws of nature. In the item of cost, he did not believe that the electric light could ever successfully compete with gas; but where cost need not be taken into account, the electric light would doubtless have its sphere of action.

CORK GAS CONSUMERS COMPANY.

The Ordinary Half-Yearly General Meeting of this Company was held at the Offices, South Mall, Cork, on Friday, the 14th inst.—Mr. T. Mahony in the chair.

The Secretary (Mr. Denny Lane) read the following report of the Directors:—

Gentlemen,—The annexed accounts for the half year ending at December, 1878, will, we trust, be found satisfactory by the Proprietors. Although the rental, as compared with the corresponding period of 1877, shows a decrease of about £700; this is to be attributed to the reduction in the price of gas, which came into operation last year. The actual quantity sold shows a small increase, which would have been greater were it not that the unprecedented severity of the winter, by causing obstruction in the mains, and by freezing many meters, prevented us, in some instances, from giving a full supply to the consumers. The public in many other cities suffered similar inconveniences from the same causes. The illuminating power of the gas has been uniformly good, and far in excess of the parliamentary standard.

The consumption having increased in some districts, we are about to lay larger mains in order to improve the supply. We have extended for a further period a contract for coals, which we had made on favourable terms.

As our efforts to obtain from the Government the cost of the prosecution in the case of our former Accountant have, up to the present, proved unavailing, we have written off £538 from the suspense account in this case.

As it is likely that the only one of the old Company's gasholders which we have not, as yet, reconstructed, will require extensive repairs, we have added £600 to the depreciation-fund.

Since the accounts were closed, we have invested £2000 more in railway debentures, bringing the sum invested out of your business up to £9100.

After making these deductions, the balance of profit and loss remains at £6307 16s. 4d., out of which we propose to pay the usual dividend at the rate of 8 per cent. This will absorb £5409, and leave £898 to be added to the reserve, which will then amount to £9998, or about half the sum to which this fund is limited by the Legislature.

Resident Engineer's Report to the Directors.

Gentlemen,—I beg to report that, after having met an increased demand for gas during the past season, we had in our manufacturing power a margin to meet any contingency that might have arisen.

It is satisfactory to note that the increase is, in a measure, due to the application of gas for cooking and heating, and we have every day testimony of the growing favour in which the use of gas for these purposes is held.

In order to meet the probable requirements of this year's business, it will be necessary to renew the retorts in No. 3 house. The other retort-houses are in good condition, but will, of course, be liable to the ordinary expenditure for wear and tear.

As soon as the winter work is completed, No. 3 gasholder will be subjected to a complete examination, and thoroughly repaired or reconstructed. The expenditure on this head may be considerable.

(Signed) Thomas Travers.

Dr. *Capital Account, Dec.* 31, 1878. Cr.

Share capital of the Company	£150,000	0	0	Amount paid on shares	£135,399	0	0
Debentures	15,250	0	0	Ditto debentures	15,250	0	0
				Uncalled capital and shares not registered	14,397	0	0
				Due by Shareholders on registered shares	204	0	0
	£165,250	0	0		£165,250	0	0

Revenue Account.

Coals	£7,229	1	6	Rental—			
Labour	2,824	2	11	September quarter	£4,615	2	10
Wear and tear	1,615	16	11	December ditto	11,566	18	7
Purifying materials	77	19	2	Public lighting—			
Water and gas at works	110	5	8	September quarter	749	3	3
Public lighting	398	2	6	December ditto	1,354	5	6
Salaries	969	0	0	Residuals	5,241	17	1
Rents	160	18	1	Transfer fees	3	19	0
Rates	1,435	2	8				
Advertising and stationery	61	15	1				
Office expenses	159	17	3				
Auditors	20	0	0				
Directors	175	0	0				
Profit and loss	8,294	4	6				
	£23,531	6	3		£23,531	6	3

The Chairman, in moving the adoption of the report, said he might congratulate the meeting on the satisfactory state of the Company's affairs, and he was sure that was very pleasing to them. They stood in a better position than they had ever done before with regard to their reserve-fund. There was, however, one item in the accounts on which he wished to make a remark, and but for it they would be in a better position; that was the sum they had to pay for rates. This year they had to pay in rates £1461, while in the corresponding period last year they had to pay only £861 18s. 1d.—a sum less by nearly £600 than this year. This arose from the fact that their valuation of mains had been considerably increased within the past twelve months. They had remonstrated with the authorities in Dublin, and they had every reason to hope that, when all the circumstances of the case, and the comparative rates paid in other cities, were known, a more reasonable view of the case would be taken than at present. This was a greater cause of anxiety to them, inasmuch as valuation in Cork was generally under the actual value. They were in correspondence with the Valuation Office in Dublin, and hoped that this matter would be viewed in a more reasonable light. They had not succeeded in getting anything from the Government to recoup them for the prosecution in the case of their late Accountant; but, meantime, they thought it better not to retain in their accounts so large a sum, which did not promise to prove an asset, and they had consequently written off half the cost of the prosecution. They still retained the National Agency bills and Bowles Brothers bills, amounting to £430. They certainly expected to receive money out of these; but he feared it was very problematical whether they would get anything from the Government on account of the prosecution. They should have sent out a larger quantity of gas, but during the severe weather all gas companies were subjected to obstruction and inconvenience, caused by the deposition of naphthaline in the mains, on occasions of great and sudden atmospheric changes. In the Journal of Gas Lighting for Dec. 17 last, the following paragraph appeared:—"We are reminded here that the season for complaints has set in, and no doubt it will be severe. Naphthaline occasions a great deal of trouble, and, should the frost continue, will no doubt cause more. Under these circumstances, it is for managers to consider whether some means cannot be adopted for preventing its deposition." No sufficient preventive has, however, yet been discovered. Many of the consumers had to complain of a want of supply about Christmas-time on that account. In addition to the deposits in the pipes, the frost had cracked some of the mains, which, of course, also interfered with the supply to the consumers. Turning to the other side of the question, the Company had a great deal to congratulate themselves upon. Owing to the low freights, they had been able to obtain coals at very exceptional rates from Newcastle, and had kept their stores well filled; and, while observing a due regard to the fact that summer was approaching, they were still availing themselves of these low freights. The very cold weather had this one advantage in their case, that they were enabled to sell all their coke as fast as it was made—a circumstance which greatly increased the profit derived from it, and enabled the consumers also to get the article in a better condition. An eminent scientific gentleman at the Queen's College had recently congratulated their Secretary on the very great future which he believed was before gas, with regard to its employment for heating and cooking purposes. That was an experiment which had proved very popular as far as it had been tried. He (the Chairman) could testify to the superior cooking of joints by gas, as compared with kitchen fires. Gentlemen who had used the apparatus in their houses had come to the Company's office and stated that if they had known the advantages of gas for cooking purposes they would have used it long since. When the Company went to Parliament for their Bill, they obtained full powers to deal in these articles; and now other companies, who had not displayed the same foresight, were asking for similar powers. The extension of this branch of their trade had the advantage of causing consumption by day as well as by night, in summer as well as in winter. If they only induced the public to consume gas in summer as well as in winter, they might be quite certain of the continuance of their present dividend. Fortunately, he could say that the Company had not been affected by the electric light so much as other companies, the shares of some of which fell as much as 30 per cent. In fact, the entire transfer of stock in the Company was only to the extent of about 260 shares, or £1300 of stock. But when he told them further that these shares were transferred, not to outsiders, but to other Proprietors in the Company, and that at this moment they had only two new names on the register, they would see that the Shareholders had displayed greater confidence in the stability of the Company, and in its power to pay the dividend, than had been the case with other companies, and also that they had confidence in the expressed opinion of their Secretary in reference to the electric light. He thought the Shareholders owed a great deal of gratitude to Mr. Lane, for the confidence with which he had inspired them at their last meeting. When he was going to Paris and to London, the Directors requested him to pay attention to this question, and before the close of the meeting Mr. Lane would give them the result of his observations in those cities. He concluded by moving the adoption of the report and accounts.

Mr. J. T. Lamerte seconded the motion, which was put and carried unanimously.

On the motion of Mr. B. J. Alcock, seconded by Mr. Bresnan, a dividend of 8 per cent. per annum was declared for the half year ending Dec. 31, 1878.

Mr. G. Lynch said, as it should be the desire of the Company to be on the most friendly terms with their customers, he would suggest that attention should be paid to a few matters that sometimes caused unpleasantness. He thought it would be well if the Directors employed a few additional gas-fitters, and, instead of terminating their superintendence of the gas supply at the meter, they should extend it as far as the burners, and, where necessary, even provide new burners. The Company could do this at very little cost, while if a consumer were obliged to employ a gas-fitter on every petty occasion, it would cost him several shillings.

Mr. M'Ostrich was of opinion that the Directors should entertain this proposal with great caution. He thought its adoption would lead to considerable expense, as well as increase the Company's responsibility. If anything went wrong, the blame they would incur would far outweigh any credit they might get.

The Chairman said it was a useful suggestion, and the Company at present carried it out in practice, where the work did not involve much delay to their men. Indeed, it was to their interest to replace bad burners by good ones.

Alderman Keller and Mr. Lamerte testified to the great anxiety of the officials of the Company to attend to complaints, and make good all defects.

The ordinary business of the meeting then concluded.

In accordance with the intimation of the Chairman,

Mr. Denny Lane rose to address the meeting, and was very cordially received. He said he felt extremely gratified by the statement of the Chairman, that his (Mr. Lane's) strong opinion on the question of electric lighting, as affecting the interests of gas companies, had been, to some extent, communicated to their minds, and had eventuated in this result, that only £[illegible] of the Company's stock had changed hands—he might say among the Proprietors themselves. He believed that had it not been for some cases where executors found it necessary to sell stock in the Company, the entire amount that would have changed hands would have been only £700. The opinion which he had expressed was not hostile to the electric light. He had said there were many cases in which it could be employed, and employed beneficially; for instance, in large open spaces, such as Trafalgar Square, and at the Albert Hall, in London; also in Paris, where the Municipality did not care how much money they spent, provided they obtained a good light. At the same time, he had said he did not think this would cause the loss of one farthing in the profits of gas companies. What he had reason to believe before, he was convinced of now—that the introduction of the electric light, by demonstrating, in the case of those large open spaces, the perfection to which lighting could be brought, would make the public look for that good illumination in other cases where it could only be supplied by gas. The whole question of electric light divided itself into three points—first, the production of the electricity; secondly, the conveyance of that electricity from the place where it was produced to the place where it was consumed; and, thirdly, the conversion of that electricity into light. He would commence with the last point. That had been put into practice in as full perfection at the beginning of the present century, by Sir Humphry Davy, as it had ever been since, and that with 50 per cent. more economy than in the case of the present much-vaunted Jablochkoff candle. In fact, there had not been a shadow of a shade of increase in the quantity of light—though there had been an increase in its steadiness—generated from a given quantity of electricity. As regarded the first point—the generating of the electricity—a great improvement had been made in that respect by the substitution of motive power for galvanic batteries. In a letter on this subject, he had said it was impossible to improve on the machines used at present for this purpose; and he had had the very great gratification of being assured, by some of the very highest authorities in England, that his proofs on this subject were complete, and that there was no possibility of producing a greater amount of electricity from a given motive power. Consequently, on that point, the passage was barred—the law of nature came in, and forbade them going further. Therefore, in the production of electricity no improvement could be made. Now as to the remaining point—one of the most important of all—the distribution of the electricity. It had been asked, if a 1000-candle light could be obtained, why not get 10 lamps, of 100 candles each, from the same source? Mr. Preece, the electrician to the Telegraph Department of the General Post Office—the highest public electrical appointment in England—stated that it was a vain dream to suppose that electricity could be divided beyond a certain point—five or six lights could, indeed, be obtained on one circuit—and proved his assertion conclusively by a mathematical formula which it would be both tedious and unnecessary to go into. The heads of the Telegraph Department in India, who were engaged in the problem of lighting large stations there with the electric light, had come to the conclusion that it was more economical to have a separate machine for each light, than to have, say, five lights on one circuit, as in the case of the Jablochkoff light in Paris. Then there was the enormous cost of distributing the light. A gentleman stated some time ago, in New York, that he could supply London with the light from an electrical

machine in the former city. That could be done; but from a calculation, made on undoubted data, the cable that would be necessary for the purpose would cost something like £17,000,000,000 of British money! An eminent electrician had shown that in Berlin alone the cost of the conductors necessary for supplying the city with the electric light would be £11,000,000 sterling of English money. First, then, they had the fact that there had been no improvement made in the results obtained in the process of converting electricity into light since the time of Sir Humphry Davy; secondly, that motive force was the cheapest agency yet discovered for the production of electricity, and that it was impossible to make any improvement in the present machine for employing that force; and, thirdly, that it was impossible to divide, and enormously expensive to extend the use of the electric light. He thought, then, they might safely come to the conclusion, that the electric light could not damage their property to the extent of a single farthing. He was at a conference of gas engineers, held in London in October last, at which they discussed the best method of lighting certain streets, so as to show gas in competition with the electric light. A few months afterwards, the road leading from Waterloo Bridge to the South-Western Station had been lighted with gas by a new method, and the public were greatly surprised at the excellent light thus produced. The same had been the case in Waterloo Place, Regent Street, within the past few weeks. A London gentleman who had called on him some six months ago, and who was then full of the great things the electric light was to do, had completely changed his mind since he had witnessed the result of the new method of gas lighting in Waterloo Place, which, he stated, far transcended the electric light, and which was much cheaper than the cheapest electric light ever introduced. When people saw that, they would not be satisfied with the present wretched street lighting—London was in comparative darkness compared with Paris. They would want more light. There was only one source for supplying them, and gas companies had that source.

On the motion of Mr. M'Ostrich, seconded by Mr. J. O'Sullivan, a vote of thanks was passed to the Chairman, for his valuable services in the management of the Company's business; and to the Secretary, who had conferred most valuable benefits on the Proprietors, by using his great scientific attainments for the protection of the value of their property in a time of wild panic.

The Chairman, in returning thanks on his own behalf, said no one who was not associated with the management of the Company could possibly have the remotest idea of the great value of having a person of Mr. Lane's eminence in the scientific world to confer with in times of difficulty.

Mr. Lane returned his sincere thanks to the meeting, and assured them that, independently of any feeling he had with regard to himself, it gave him the highest gratification to find that they had already placed such reliance on his words. He would not have spoken, only that he believed he was saying what was the truth, and was speaking on a subject he thought he understood. He was glad to know that none of them had disposed of their shares in an unreasoning and foolish scare, when people, moved by wild assertions—made they knew not on what authority—parted with valuable property, perhaps to persons who, themselves, spread these reports, in order to depreciate that property for their own purposes.

The proceedings then terminated.

BURY ST. EDMUND'S GAS COMPANY.

The Half-Yearly Meeting of this Company was held on Friday, the 14th inst.—Mr. G. Thompson in the chair.

The Secretary (Mr. Salmon) read the report, which merely recommended the payment of the usual dividends.

The capital account showed that repairs and additions to the works to the amount of £393 17s. 3d. had been carried out, and £17 5s. now remained in hand. The revenue receipts were as follows:—Balance from last account, £2438 7s. 4d.; coke, tar, and liquor, £567 12s. 7d.; fittings and labour, £169 19s. 5d.; gas and meters, £2166 4s. 9d.; arrears collected since July 1, £1468 7s. 2d.; arrears due, £3748 [illegible]s. 9d.; surplus stock applicable to dividend, £317 17s. 4d.—total, £8017 [illegible]0. 0d. The disbursements were—Wages and salaries, £949 11s. 4d.; printing, advertising, &c., £113 14s. 1d.; coals, cartage, freight, and carriage, £1481 10s. 11d.; fittings, &c., £58 12s. 4d.; meters, £42 7s. 6d.; lime and luting, £25 17s. 6d.; repairs, £404 15s. 11d.; dividends due Jan. 1, 1879, £1200; balance carried to next account, £3740 13s. 5d.

The Chairman said the report which he had to ask them to accept was a very satisfactory one. They, as a Gas Company, had lately passed through a rather serious ordeal, in consequence of certain scientific discoveries which it was supposed at one time would supplant gas. The scientific part of the question he would leave to others more acquainted with it than himself, and the practical result of what had taken place they doubtless all knew, from what they had seen and read. They had, perhaps, undergone, a rather more serious trial than their neighbours in that district, for without the sanction of the Shareholders, the Directors had offered the gas-works for sale. Perhaps there were some who thought they ought to have called the Shareholders together first, but the Directors felt that if the town considered it desirable, profitable, and advantageous to take the works, the Shareholders would be willing to hand them over. They did not wish to part with their works, being perfectly satisfied that they were remunerative property, and that the Shareholders would continue to receive the benefits they always had from the commencement. In the exercise of their discretion, those who undertook to ascertain the feeling of the town had deemed it prudent not to take the works. The Directors had therefore to ask the Shareholders to agree to the Bill in Parliament which they had introduced, and the legal character of which he would leave to the Secretary to explain. On referring to the accounts, it would be seen that the Directors were able to pay the usual dividend; but with regard to the capital account, they would have to call up the £1 per share remaining due upon the new shares. That would realize £1200, but he must tell them that the money was all absorbed, as a further extension of the works had become necessary. They could only look upon the business of the Company in the same way as their own—they must have increased capital if they wished to increase their business, and the profits derived from it. During the past year they had laid down new mains in several of the streets, and he hoped the consumers in those districts had benefited from the increased supply of gas. There had been complaints in some instances, at which no one need be surprised when he told them that some of the old pipes were so completely choked up that the head of a needle could scarcely be passed through the centre of them. In many cases, no doubt, the complaints arose from burners and fittings being out of order, and he suggested they might be kept in good repair by being looked to at the time of the annual cleaning of houses. Referring again to the accounts, he said they had very active collectors, and he believed their bad debts would be covered by £9 or £10, and everything could not go on smoothly without the careful attention of the Manager (Mr. J. M'Crae) to whom, he thought, they were much obliged for the manner in which he conducted the works. During the recent panic or "scare," experiments had been carried on with a view of making gas more useful, and they had stoves which they let out at 6s. or 7s. a year, and stoves for heating only at 4s. or 5s.; and if their friends in Bury could see their way to using more gas for these purposes, it would be an assistance to the Company in extending their business. Having offered to explain anything in the report or accounts if any Shareholder wished it, he concluded by moving the adoption of the report.

Mr. Burroughs, in seconding the motion, said the battle of the lights had been fully and fairly fought, and the result had proved that the old gas light had obtained an ascendancy over its rival. Scientific men had fully investigated the new light, and found by experiment that it would cost four times as much as the old one.

The motion was agreed to.

The Mayor said he was sure Mr. Thompson had discharged his duties as Chairman of the Board of Directors so much to the satisfaction of his brother Directors and the Shareholders, that they would all desire to offer him a vote of thanks.

Mr. Robinson seconded the motion, which was carried *nem con.*, and briefly acknowledged by the Chairman.

Mr. Clayton proposed the re-election of Mr. Thompson as a Director, his term of office having expired.

Mr. Smithyes seconded the motion, which was carried unanimously.

Mr. Catlin proposed, and Mr. Robinson seconded the re-election of Mr. Clay, the other retiring Director, which was agreed to; and, on the motion of Mr. Richardson, Mr. Hoy was re-elected one of the Auditors.

The Chairman proposed a vote of thanks to the Secretary, who, he said, was not only very useful in his professional capacity, but was with them weekly to conduct the business of the Company, which for the last six months had been rather more trying than usual, owing to the preparation of the new Bill which was now before Parliament, and which he expected would be in full force before they met again.

Mr. Frewer seconded the motion, observing that he could testify, as fully as any one, to the constant attention of their Secretary at all the meetings.

The motion having been unanimously adopted,

The Secretary, in returning thanks, said the past half year had been one of considerable anxiety to those who had had charge of the gas-works, which were an exceedingly valuable property—perhaps one of the most valuable in the town. They were worth some £50,000 or £60,000, and he need not say that their management was at all times a great anxiety, but during the past half year it had been more so than usual. The Chairman had alluded to the scare that had recently taken place with regard to the gas properties. Their own had been no exception, and they had not only to endure the general effect of the scare, but one of the newspapers in the town gave them a helping hand to make it as pointed as it could. However, it appeared the Shareholders had more confidence in the management of the Directors than they had in the newspaper, for during the whole of that scare not a single share changed hands. Seeing what they did before them, the Shareholders might well have been excused if there had been a large transfer of shares, and a consequent large sacrifice; but since last February there had been but one transfer of one share only, in May; while during the past half year not a single transfer had taken place. He, therefore, thought the Directors had a right to take some credit to themselves for that state of things, for if the management of the Company had been at all doubtful, they could scarcely imagine but that the property must have suffered. The Chairman had also referred to the proposition of the Town Council to become possessors of the gas-works. The application was made by the Corporation, and not by the Gas Company. They had never any desire to part with their property, and it would have been painful to the Directors to call the Shareholders together and ask them to disband themselves; but when the Corporation applied to the Company, the Directors took a sensible and patriotic course, for which they were entitled to credit. They said that if the Council thought it would be beneficial to the town that they should be owners of the gas-works, they were willing to call the Shareholders together, and, without waiting to inquire about terms, they said they were willing that the works should pass over upon an ordinary valuation made by competent persons. There had never been a jar between the Council and the Company, but the scare continued, and rather increased after the offer was made, and at the following meeting it was decided that it was not desirable for the Council to interfere with the gas-works. With that decision the Directors fell in. It might be that the Council retired from the matter for satisfactory and sufficient reasons, and they were now there to ask for a new lease, probably for the remainder of their lives. After they obtained their new Act they would start on a fresh career. Much additional outlay must take place, if the works were to continue to grow as they had done during the last seven years. They thought that when they had their new gasholder they would be able to carry on their business without additional capital, but they now found all their appliances full. They wanted, for another purpose, the space occupied by one of their gasholders, which was becoming worn out, and it might be desirable that they should erect another new one. The increase of their business had for some years past been rapid—last year very rapid indeed; and the management during that year had been something extraordinary. He believed there was hardly another company who could say as they could—that during the year there had not been a week when they had not made 10,000 feet of gas from every ton of coal, especially as they did not use cannel. If viewed as passing through the difficulties that they had had to encounter during the last six months, the demands made upon them, and their present monetary position, he did not think there was any joint in their harness that was open to attack.

Mr. Hooper said he fancied the Secretary was under some mistake as to the Corporation. One member of that body ventilated the subject upon his own responsibility, and, having done so, the Council were bound to make inquiry. He was afraid it might go forth that the Corporation were anxious to purchase, but it was more Mr. Stutter's act and deed.

Mr. Stutter said he brought the question forward, and from what then took place Mr. Thompson said the Gas Company would not stand in the way of conveying the works to the Corporation if it were so wished. A Committee was then appointed to make inquiry, and though it might probably have been wise on the part of the Council to make the purchase, the scare was then at its height, and it was felt that the town could not assent. It was a great compliment to the Company, because it was felt that good management had made it a success to the Shareholders; and there was no doubt that if taken over by the Council, and equally well managed, it would have been a benefit to the town. It was considered, however, that the time was not favourable for the transfer, and therefore no action was taken.

The Secretary said Mr. Hooper need not wish to repudiate the action of the Council. They had no object in view but the interest of the ratepayers. They thought it might be of advantage to the town, and they appointed a Committee, who inquired into the matter, and it was during the interregnum between their appointment and making their report that the scare was at its height; and they felt that if they had gone to the ratepayers with a proposal to purchase, it would have been rejected. He thought the Council had pursued a most wise and prudent course.

Mr. Stutter said it was never the intention of the Corporation to take over the works without the sanction of a public meeting; and the Committee were satisfied that at that time the town would not consent.

Mr. FREWER then proposed, and Mr. PORTWAY seconded, a vote of thanks to the Manager.

Mr. M'CRAE briefly acknowledged the compliment paid him, and assured the meeting that as long as he was in the employ of the Company he should do his best to further their interests.

A vote of thanks was also accorded to the Auditors.

This concluded the ordinary business, and the meeting was then made special, for the purpose of considering and sanctioning the Bill now being promoted by the Company for the purpose of obtaining additional powers.

The SECRETARY fully explained the nature of the Bill and its various provisions.

A resolution to the effect that the Bill be approved, subject to such modifications as might be made by Parliament, was proposed by Mr. CLAYTON, seconded by Mr. SMITHYES, and carried unanimously.

The meeting then terminated.

NEWPORT (MON.) GAS COMPANY.

The Half-Yearly Meeting of this Company was held on Monday, the 17th inst.—Mr. T. GRATREX in the chair.

The SECRETARY (Mr. E. F. Marfleet) read the notice convening the meeting, and the following report was presented:—

The accounts, as audited, for the half year ending Dec. 31, 1878, are forwarded herewith.

Out of the balance of the half year's profit, the Directors recommend the payment of the usual dividends on the A and B stocks and class C shares.

The Engineer reports that the whole of the works of the Company are in satisfactory order, yet, owing to the great increase in the make of gas, it will be necessary, before the next winter, to erect additional purifiers.

DR.—*Revenue Account, for the Half Year ending Dec.* 31, 1878.

To Manufacture of gas—						
Coals, including carriage			£3,066	2	9	
Purifying materials, water, &c.			255	5	0	
Salaries of officers at works			133	0	0	
Wages at works, &c.			814	17	5	
Repairs, maintenance of works, and plant (including renewal of retorts)			611	4	0	
			£4,880	9	2	
Less old materials sold			1	6	0	
						£4,879 3 2
Distribution of gas—						
Salaries of inspector and others			£118	6	4	
Repairs, maintenance, and renewal of mains and service-pipes, including materials			336	13	7	
Repairing, renewing, and refixing meters			85	7	3	
						540 7 2
Public lamps—						
Lighting and repairing						231 3 0
Rents, rates, and taxes—						
Rents			£12	15	9	
Rates and taxes			155	11	0	
						168 6 9
Management—						
Directors allowance			£123	7	6	
Salaries of Secretary and Clerk			164	0	0	
Collector's salary			83	0	0	
Stationery and printing, general establishment charges, and incidentals			146	18	4	
Auditors			20	0	0	
						537 5 10
Discounts and abatements						343 5 4
Total expenditure						£6,699 11 3
Balance carried to net revenue account						2,606 4 9
						£9,305 16 0

CR.—*Revenue Account.*

By Sale of gas—						
10,176,000 cubic feet of gas, at 3s. 0d. per 1000			£1,526	9	0	
4,102,500 cubic feet of gas, at 3s. 3d. per 1000			666	16	9	
26,674,300 cubic feet of gas, at 3s. 6d. per 1000			4,724	6	6	
						£6,917 12 3
Private lamps on contract, and public lighting						771 1 10
Rental of meters						326 13 3
Residual products—						
Coke			£535	10	2	
Tar			488	7	9	
Ammoniacal liquor			179	16	2	
Spent lime, &c.			29	0	11	
						1,232 15 0
Transfer fees			£0	12	6	
Interest			57	1	2	
						57 13 8
Total receipts						£9,305 16 0

The CHAIRMAN, in moving "That the report of the Directors and statement of accounts, as previously circulated, be adopted," said he was glad the accounts did not show a decrease. The Shareholders would find, from a perusal of the report, that the Directors were entitled to declare the same dividend—which, in his opinion, was a very satisfactory one—as they had previously done. Without doubt the owners of gas shares were at one time frightened by the possibility of gas being superseded by the electric light; but it appeared, from the newspaper reports, that the possibility was on the wane instead of on the increase. As far as the holders of gas stock were concerned, it was not surprising to find that they did not regret that it was so. The electric light was doubtless useful for many purposes—very useful indeed for illuminating large spaces; but as to the possibility of subdividing it so as to enable it to be a good substitute for gas, it was acknowledged by all, notwithstanding what was said upon the matter, that Mr. Edison could not do anything further than had been done. The operations at the gas-works, he was pleased to say, had gone on most satisfactorily. The increase in the consumption of gas since the year 1869 had been something wonderful. It might be interesting to the Shareholders and the public to know that the increase from that time up to the present had been more than 60 per cent. In 1868 the quantity of gas consumed was 67,247,000 cubic feet, but in 1878 it was 108,146,000 cubic feet. It was also a very satisfactory thing to note that every year had witnessed an increase in the quantity of gas consumed in the town. Of course, as the town increased in size, so proportionately the demand for, and consumption of gas increased. The works, he was glad to say, had been carried on in the most successful and satisfactory way possible, as far as the Directors were able to judge. Of course, they could not be supposed to know much about the detail of the works, but they did know that the results had been most satisfactory; and he might add that every attention had been paid by the officials of the Company to the carrying on of the works. One question of importance for consideration was that the Engineer (Mr. T. Canning) had informed the Directors that he must have a considerable increase of purifying apparatus, in order to be prepared for the demands of next winter. As the Shareholders were aware, the purchase of land for this purpose had been effected; it had not yet been completed, but it would be shortly. Consequent upon this, a call of £2 per share had been made, and would have to be paid by the 1st of April; but he fully believed that the extra expenditure would prove beneficial to the interests of the Shareholders.

Mr. PHILLIPS seconded the motion, which was agreed to.

The CHAIRMAN then moved—"That a dividend at the rate of 5 per cent. on class A stock, 3½ on class B stock, and 3½ on class C shares, for the half year ending Dec. 31, 1878, be declared payable on the 24th inst." In doing so, he alluded to the appointment of a Gas Examiner by the Town Council, and pointed out that the reports of that official had been most satisfactory as concerned the Company.

Mr. CHRISTOPHERS seconded the motion, which was also carried.

A vote of thanks to the Chairman, proposed by Mr. WILLIAMS, seconded by Mr. R. H. RICHARDS, and carried unanimously, terminated the proceedings.

WEYMOUTH CONSUMERS GAS COMPANY.

The Ordinary Half-Yearly Meeting of this Company was held on Thursday, the 18th inst.—Mr. DAMON in the chair.

The SECRETARY and MANAGER (Mr. T. Stone) read the report of the Directors, which stated that the half year's working had been so satisfactory, that, together with the balance brought forward, they were enabled to declare a dividend of 10 per cent. on the original shares, and 7 per cent. on the 1875 shares, to be paid free of income-tax, and the remaining balance to be carried forward.

The CHAIRMAN, in moving the adoption of the report and account, said: Gentlemen, you have heard that the business of the Company for the last six months has been in a satisfactory condition. Coals have continued low, but the cold season has created a demand for gas, both day and night, beyond that of any former period. I am informed by the Manager that as much as 35,000 cubic feet of gas has been sent out in one day—in the eight hours of daylight—for heating and cooking purposes alone. When we succeeded to the works, the day consumption of gas was so small that the leakage and waste, consequent upon the supply being kept open, was a source of loss to us. It is now a source of income—an increasing source, of which even the adoption of the electric light cannot deprive us. The increased make of gas has made a corresponding increased production of coke, but, having reduced the price to a point lower than it has ever been sold at, for the first time in the history of the Company the local demand has prevented us from stocking beyond our means of storeage. The state of the Company's affairs leaves me but very little to dwell upon; but there is one matter I wish to bring before you. You are all aware that, besides our share capital, we have a loan capital of £10,000. For certain reasons this £10,000 will be required in the January of next year. The Directors, after much consideration, propose to replace this loan by issuing debentures of £50 and £100 each, bearing interest at 4½ per cent. These debentures will be an investment of the highest class, for, besides being assured by the income of the Company, they will have the additional security of being mortgaged, and will therefore be a first charge on the Company's works. Moreover, these debentures will be as convertible or transferable as bank notes, changing hands without any cost. No doubt they will be readily taken up, offering, as they will, a higher rate of interest than savings banks or money on deposit. Of course we might replace this £10,000 by a single mortgage, but the Directors think that by raising it in the town it will be to the advantage of small investors, and identify a greater number of persons with the interests of the Company. Just now it is too early to do more than make an intimation of what the Directors propose, but at the next half-yearly meeting we shall be in a position to make a more detailed statement.

Mr. CHAPPLE seconded the motion, which was put and carried.

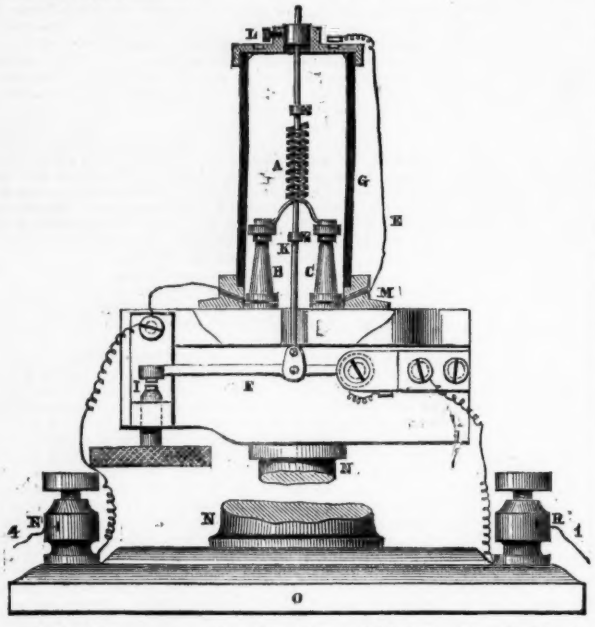
The SECRETARY and MANAGER, in reply to a question as to whether there had not been any sale of ammoniacal liquor, said the Shareholders were aware the Company now had plant for manufacturing their ammoniacal liquor into sulphate of ammonia, and it would be fresh in their minds that the Company were, as he thought, and he believed now almost every one else thought, wrongfully charged in the town with creating smells arising from the manufacture of this sulphate. In consequence, the Directors had requested him to desist from the manufacture for some time, and to give notice to the Local Authorities when the work was to be resumed. The manufacture of sulphate of ammonia was resumed about a fortnight ago, when notice was given to the Local Authorities of what he intended doing, and inviting them to make a full inspection of the plant, or what they could find upon the works likely to be a nuisance. The Directors also attended, and took great pains, he must say, to discover if any nuisance did arise from the manufacture. It was perfectly clear to all that the nuisance which had been experienced in the town some time since had not arisen from it, and there was no reason why the slightest nuisance should arise. The work had been going on daily ever since, and everybody appeared to be ignorant it was being engaged in. There was not one particle of pretence for fastening upon the Company the creation of any such nuisance as existed in the town last summer. In the past fortnight they had made about 3½ tons of sulphate of ammonia. The value of it at present was very low, so that if the liquor were his own he should not work it. The price now at which the sulphate was sold would barely give them £16 net per ton, whilst it had realized from £20 to £21 per ton; but even at the present time it gave them a profit. Replying to another question as to whether he expected the price of this material to rise, he said he did. The decrease in the value of the article was the result of the general depression of trade. He had no doubt that upon this item alone, even with the present depressed condition of trade, they would gain at least £100 or more a year from the manufacture. In answer to further questions, he said, if the Company sold the ammoniacal liquor they would probably realize £120 or £130 a year, but if it was manufactured into sulphate of ammonia, £300 a year would be realized. The coke account had been in a depressed condition, the Company having only realized £418 in 1878, against £528 for the corresponding period of the previous year, showing a loss of £110, notwithstanding the Company used 222 tons more coal. As to whether the extra consumption of gas did not compensate for the loss on the coke account, he said that it did. In the half year they had increased the gas revenue by £380, 21 million cubic feet having been consumed, being about 2 millions in excess of the corresponding period. Tar was a very important item, and this arose from the fact of the Company having made a contract at an improved price; but since then the value had again fallen. There was only one other item, and that was very ominous—rates and taxes. The Shareholders must be prepared for a very heavy item of expenditure in this respect, as the Company had been fearfully put up in the new assessment—in fact, quadrupled. The average Poor and Board of Health rate for the past ten years was £153 7s. 9d., but under the new assessment it was £460. The Gas Company, the Railway Companies, and the Water Company had been selected for assessment by a competent surveyor, but as the increase on their Company had been so enormous, the Directors had referred the matter to Mr. Ryde, who was one of the first surveyors in the kingdom, to protect their interests.

Votes of thanks were then passed to the Directors, and to the Secretary and Manager, and the proceedings terminated.

EDISON'S ELECTRIC LIGHT.

As mentioned in last week's JOURNAL, the specification of the first of Mr. Edison's French patents in connection with the electric light has been published, and in the *Engineer* of the 14th inst. engravings were given of the machine and lamp.

As to the former, our contemporary says: "All anxiety concerning the Edison light may be put on one side. It is certainly not going to take the place of gas, and its invention would not have been regarded with the anxiety and interest which have been displayed, had it not been for the statements of newspaper reporters on the other side of the Atlantic." And further on, after describing the electro-magnetic machine: "Mr. Edison has probably succeeded in producing the very worst magneto-electric machine ever made—that is to say, if he has really ever constructed one according to his specification, which we much doubt. Mr. Edison cannot imagine for a moment that the system of producing currents by magnets which approach to and recede from each other, as described, can be in any respect equal to that on which the Gramme, Siemens, or Lontin machines are based. It is, in fact, and for reasons which are well understood by all electricians, much inferior to the most defective of the machines we have named. Mr. Edison adopted the arrangement with the idea of reducing the power required to develop the electricity he needs. If we have two electro-magnetic machines, one theoretically much less efficient than the other, it may nevertheless be practically the better of the two, provided it produces electricity with much less expenditure of power than its rival; and thus, although Mr. Edison might use his magnets and wires to great disadvantage, yet if the power required to actuate them was very small, he would be justified in following the course he has actually adopted. But in truth, Mr. Edison is entirely mistaken in his notions on this point. . . . Any attempt to work to Mr. Edison's specification, would give a slow-moving, heavy machine, very much inferior to anything now in the market. We need say nothing more concerning this part of his invention. In this country, and, indeed, in the United States, little has been heard about the Edison electro-magnetic engine, and it is possible that he himself attaches very little value to it. It was not any terror of its advent that induced people to sell their gas shares. The Edison lamp was the real cause of panic among the gas-makers."



We give above an engraving of the lamp, which is thus described by its inventor:—

"Platinum and other materials that can only be fused at a very high temperature have been employed in electric lights; but there is risk of such light-giving substance melting under the electric energy. This portion of my invention relates to the regulation of the electric current, so as to prevent the same becoming so intense as to injure the incandescent material. The current regulation is primarily effected by the heat itself, and is automatic. I have shown the light-producing body as a spiral, A, connected to the posts, B C, and within the glass cylinder, G. This cylinder has a cap, L, and stands upon a base, M; and, for convenience, a column N, and stand, O, of any suitable character, may be employed. Most of the other figures are in the form of diagrams to more clearly represent the electrical connections. I remark that it is preferable to have the light within a case or globe, and that various materials may be employed, such as alum water, between concentric cylinders, to lessen radiation, retain the heat, and lessen the electric energy required; or coloured or opalescent glass, or solutions that reduce the refrangibility of the light, such as sulphate of quinine, may be employed to moderate the light, and the light may either be in the atmosphere or in a vacuum. The electric circuit passes by line 1 to the post R, and by a wire to the lever, F; thence by the wire or rod, K, cap, L, wire, E, to the post C, through the double spiral, A, to the post B, and by a metallic connection or wire to the post N 1 and line 4, and so on through the electric circuit, and the light be developed in A. The rod, K, will expand in proportion to the heat of the coil, or in proportion to the heat developed by the passage of the current through the fine wire, and, if the heat becomes dangerously high, injury to the apparatus is prevented by the expansion of the rod, K, moving the lever, F, to close the circuit at I, and short circuit or shunt a portion of the current from the coil, A, and reducing its temperature. This operation is automatic, and forms the principal feature of my invention, because it effectually preserves the apparatus from injury. The current need not pass through the wire or rod, K, as the expansion thereof by the radiated heat from the coil, A, will operate the lever, F, but the movement is not so prompt. It is to be understood that in all cases the action of the short circuit or shunt is momentarily to lessen the current through the light-giving substance, and the circuit-closing devices play up and down at the contact point, maintaining uniformity of brilliancy of light."

We quite agree with our contemporary that "there is nothing about the lamp analogous in simplicity to a gaslight, nor is it obvious that it can ever be made to comply with the ordinary requirements of domestic life. Mr. Edison will no doubt attain much success at Menlo Park, where everything will be under his own control; but for the ordinary purposes of lighting our houses an electric lamp has probably yet to be invented. With all its defects for domestic purposes, still Mr. Edison's lamp might perhaps be used to much advantage for street lighting, and in factories or theatres—in fact, in any situation where it could be looked after by a skilled attendant. If the current can be successfully divided among dozens of such lamps, then may gas-makers quake; but nothing of the kind can be done. We know at last that Mr. Edison has done no more to divide the electric light to advantage than has Mr. Werdermann."

THE PROPOSED PURCHASE OF THE DERBY WATER-WORKS BY THE CORPORATION.

A Special Meeting of the Derby Town Council was held last Wednesday—the MAYOR presiding—for the purpose of consenting to the heads of an agreement between the Company and the Corporation for the transfer of the undertaking of the former.

The TOWN CLERK read the heads of agreement, of which the following is an abstract:—

The Company shall sell, and the Corporation shall purchase the Company's undertaking, which includes all works, real and personal property of the Company, and all rights, &c., therein. The consideration shall be £308,000, payable in cash and in annuities, as follows:—£10,000 in cash by the 1st of October, 1879; £2000 in cash on the 1st of January, 1880; annuities to the aggregate amount of £10,720 per annum, payable half yearly; the first half year's payment payable on the 30th of June, 1880; annuities to the aggregate of £1120 per annum, the first half year's payable on the 30th of June, 1885. The Company to have the power, upon giving three months notice, to require a further payment in cash not exceeding £30,000. In the event of that being required, the annuities, amounting to £10,720, should be reduced in proportion, taking such annuities at 25 years purchase. After the 1st of January, 1890, the Corporation shall, on giving twelve months notice, redeem any annuity at par—viz., at 25 years purchase. In addition to the sum of £308,000, the Corporation shall pay the interest on the debenture debt of the Company, which amounts to £43,300. The interest payable is 4 per cent. The purchase to take effect on and from Jan. 1, 1880. The Corporation to pay the money expended by the Company on capital account between the date of the agreement and the end of the year. The Officers of the Company, consisting of the Resident Engineer, the Secretary, Accountant, Inspectors, and Collectors, to be retained at their present salaries. The Company to be empowered to present a petition against the Corporation Improvement Bill on clauses only, and the cost of opposition on such clauses to be paid by the Corporation.

Alderman BEMROSE moved that the common seal be affixed to the heads of agreement for the purchase of the undertaking of the Derby Water-Works Company, and in doing so said that the Parliamentary Committee were instructed to promote a Bill in the present Session of Parliament for the compulsory purchase of the Derby Water Company's undertaking, but the Council desired that, if possible, a parliamentary contest should be avoided, and instructed the Committee to endeavour to approach the Directors of the Company, obtain an interview, and open negotiations. That request was made to the Directors, and at once refused. The Council requested the Committee to try again. They did so, and met with a like refusal; and, for reasons which had been since explained, and which were perfectly satisfactory, the Committee could quite understand that the Directors were placed in a position that they could not but refuse to meet them. Well, the Committee, feeling entirely with the Council that a contest before a Committee of the House of Parliament would certainly be very expensive, and would lead inevitably to a great amount of ill-feeling, and was on all grounds to be avoided, followed up their endeavour to open negotiations. They were fortunate in obtaining the services of a gentleman as go-between who was perfectly independent, and through him the Directors decided, without prejudice on either side, to meet them. There had been much negotiation and inquiry going on for some time. They met as trustees of two bodies—the Directors, as trustees of the Shareholders, were bound to do the best they could for them; and the Committee, as trustees of the town, were bound to do likewise. Having cleared the ground thus far, they did not find much difficulty in getting on. They had access to the books, and their Engineers were enabled to inspect the Company's works and plant, and everything in their hands, and the agreement which had just been read had been the outcome of all that. Every item had been thoroughly canvassed, over and over again; and, as far as the Committee could do so, they had thoroughly exhausted every item referred to in the agreement, which was a good bargain for both parties. The Shareholders of the Company had undoubtedly the prospect—a future more or less removed—of advantage over their present position as regarded dividends. But the good bargain consisted in this, that they would obtain a large present advantage. On the other hand, it was perfectly clear that it might be a good bargain for the town also, because, as a Corporation, they possessed advantages which the Shareholders could never hope to possess. The town, as owners of the works, would have the ordinary increase which the Company had had—the increase in the town, the increase in the sale of water; and as a Corporation they would be able to effect a saving which the Company could not. The great elasticity of these affairs was evidenced by the fact that wherever water-works were taken in hand by an Authority, the revenue, from one cause or another, went up. That was the general experience, and upon it they might safely rely. Then there were sanitary advantages, which had largely influenced the Council in their desire to possess these water-works, and whether they considered water from a sanitary point of view, or as a necessary article for each individual, it commended itself at once that the Local Authority were the proper persons to have charge of its supply, so that whatever benefit might accrue from its management might accrue to the town at large. There were other matters—interference with the streets, and various minor questions of convenience—which were not to be overlooked. These were the advantages they possessed over the Water Company, and those advantages would enable them to do what the Company were not able to do. The heads of the agreement contained many items, usual in transactions of this kind, which referred to carrying on the works for the next ten months, for the carrying of the Bill through Parliament, and for the winding up of the Company. The chief point in the agreement was that of the purchase-money, which had been given at £308,000, and the debentures. The payments might be divided into three periods. They paid at once, after the purchase, an annual sum of £12,932, not including debentures; then a further sum, making together a total of £14,052—the second sum beginning in 1885. In the year 1890, they had to commence laying by a sinking-fund, to enable them to pay off the whole amount in 60 years at the most. The annual amount of the sinking-fund would be £1525. With regard to the financial position in which they should stand, the Committee had been fortified in the recommendations which they made. They felt greatly the responsibility which had been laid upon them, for two reasons. There was the responsibility of investigating the affair, and there was also a further responsibility, which was that, in this stage of the proceedings, the Committee were not able to lay before the Council all the information they had obtained. In obtaining that information, they had called to their aid their Parliamentary Officers and Engineers; but they were not in a position to give their reports. This was a preliminary agreement, and it would be impolitic and wrong to

give details; therefore, the Committee felt the responsibility upon them the more. But after the most careful examination of these reports, and after all the information they had been able to obtain (and there were several members who were able to form an opinion on this matter, and who had had an opportunity of examining the details), the Committee put it before the Council broadly that during the first few years in which they took to the water-works there would be a deficiency. They would have to pay certain amounts—annual payments for interest and purchase. What was proposed was that on the 1st of January next the whole of the money would be met by the issue of "Derby Corporation Water-Works Annuity Bonds," the interest on which would be paid half yearly. Those bonds would be redeemed time after time, and the whole would be finally extinguished in 60 years from the commencement of the account in 1890. During the first few years of the purchase there would be a deficiency which was variously estimated. During the latter part of the first ten years, however, there would be a surplus; and when they were at the end of the ten years, although he would not pledge himself to a year or two, the surplus which would have come in would more than pay the deficiency of the first few years—that was, the income of the water-works would be more than sufficient to pay the whole of the outgoing expenditure. At that time it would be for the Corporation to say what they should do with the increase—an increase which would take place gradually, varying with the increase of the town. Means could readily be acquired by which the deficit of the first few years could be dealt with, and prevented from being a serious burden upon the rates of the borough. From 1890 the town would gradually, year by year, obtain an increased benefit from the water-works. At the end of 60 years the borough would be possessed of the undertaking, and the whole amount that it would have to pay over a certain number of years would cease to have to be paid. A large item would then be formed, which would enable the Council either to reduce the price of water to a nominal amount, or they might apply it for the relief of the expenses of the borough from year to year. The Council were asked to affix the common seal to those heads of agreement. The Company would immediately have a meeting, and, if they assented to the Chairman putting his signature to the document, they should at once proceed by their Parliamentary Agents to draw up a full agreement, and, in consort with the Agents of the Company, to draft the agreement in the Bill which was being promoted before Parliament. The Company would then appear to watch the progress of the Bill, and ensure the clauses of the agreement being carried out. Supposing the Company's Shareholders, who would be called together at as short a notice as possible, sanctioned that agreement, then they would proceed to Parliament with a practically unopposed Bill. He thought the Council would say it would be wise that this course should be adopted, and the result would be that they should have obtained this undertaking on terms which he ventured to say were undoubtedly equitable, and when examined would be found to be so, for they would have a gradual increasing benefit from them year by year; and in the future, which might be more or less distant—certainly not more than sixty years—the town would be possessed of the water-works without any further charge. In times past the town had an opportunity of obtaining the works under much more favourable circumstances, but unfortunately that opportunity was missed. He trusted the Council would, by a unanimous vote, approve of the strong recommendation made to them by the Parliamentary Committee, who had exhausted every means they could have possessed for arriving at a most careful, a most true and sober estimate of this affair. They might have given the Council some particulars to lead them to do that, but they asked them to have confidence in their general experience in matters of that kind. Undertakings of this sort invariably resulted in far greater advantage than they were expected to do, and he asked the Council to take the Committee's recommendation on trust in these matters of detail, which it was perfectly evident the Committee were not able to lay before them in the present stage of the proceedings.

Mr. Buchanan seconded the motion. He thought the result would be found to prove that, in a very reasonable number of years, a state of things would be arrived at which would be satisfactory to all. There would be a deficiency for the first few years, but the balance would recover itself in such a way that they would be in a very fair position indeed.

Mr. Stenson said he was not a Shareholder in the Water Company, and, therefore, he did not know what their receipts were. Alderman Bemrose had told the Council what they had to pay, but he did not tell them what the annual income and expenditure of the Company were. He also wished to know what interest the Company were paying for the £43,300 they had on loan, whether there was any overdraw at the bank, and what accounts were owing. £360,000 was a large sum to pay, and, taking the population of Derby at 80,000, the amount came to £4 10s. per head, which was a tremendous engagement for the borough. At 4 per cent. the interest on the money would be £14,400 per year. He was not against taking the water-works—in a sanitary point of view he thought it necessary; but he really thought they were paying a great deal too much. If the purchase had not included the £43,300 borrowed money, it would have been a better bargain, and still a good bargain for the Company.

Mr. Harrison remarked that if Mr. Stenson had listened he would have heard that the Company had to pay the whole of their debts, except the debentures, and if, within three months after the taking over of the works, there were any outstanding debts, the Corporation had power to discharge them, and deduct the sum from the amount to be paid to the Company. When this matter came before the Council some time ago, he (Mr. Harrison) moved an amendment that the matter should stand over for another twelve months, because, as a Shareholder, he felt convinced that the way in which the Directors were making the dividends was such that the shares must go down, and in twelve months they might make a better bargain than at the present time. He would not give any details, but he simply wished to say that, having gone carefully through the Company's books, he thought the statements made by Alderman Bemrose were very moderate indeed. Whilst being a benefit to the Shareholders, he (Mr. Harrison) thought that the transfer would be very advantageous to the Corporation.

Mr. Russell said the Council were paying £350,000 for the purchase of the undertaking, and he wished to know what was the capital of the Company. He was told that the capital was £136,000. Was that so?

Alderman Bemrose; Yes, that is the paid-up capital.

Mr. Russell said they were then going to pay double the amount of the paid-up capital of the Company, and £50,000 over.

Alderman Bemrose observed there was an item of £24,000 not yet called up, in which the Company had undoubtedly a prospective advantage.

Mr. Russell: Then we are going to pay them the £24,000 before they have actually raised it?

Alderman Leech: The interest, that is all.

Mr. Russell said it seemed a large sum of money, considering the Shareholders had not paid it. He highly approved of the purchase, but he was afraid they were giving too much.

Alderman Longdon said that with regard to the sum to be paid, he admitted it was a large amount. It was the largest bargain the Corporation had ever been concerned in. But if it was a good bargain, as every tradesman knew, the larger it was the better. The basis of the agreement was that they had to give the Company, whom they were compelling to sell, a *quid pro quo* for their rights and privileges, present and future. If they compelled a man to sell them a property, they were not only bound to pay him what it was bringing him in now, but they were bound to recognize his reversionary interest to a reasonable extent. Most certainly if they had carried this matter to Parliament, a Committee of the House would have compelled them to pay the present and future value of the undertaking. And in doing that they would be simply paying what would never be a burden on the rates. Mr. Stenson was anxious to know the income and expenditure of the Company, and a variety of other items. He could not answer him exactly, but he would say that the price the Corporation were asked to pay was such that the ratepayers would never know anything about it, unless they desired to do so—he meant they would not feel it in their pockets. No ratepayer would ever feel, as far as his present belief went, that he was a Shareholder, except to his benefit. The present small deficiency would only be a few thousand pounds. In 70 years the town would be in full possession of the water-works, with all the profits, and no responsibility but the working expenses, and the ratepayers would feel nothing. By making the purchase they secured the ratepayers from the possibility of paying a higher water-rate than they paid now, and that was more than could be said if the undertaking remained in the same hands as at present.

Mr. Whitaker agreed that this was the most important bargain the Corporation were ever asked to undertake, and he concurred with previous speakers that the town should be possessed of the water-works. His only regret was that the town did not take the opportunity of becoming the owners when they might have done so at a much less price.

Mr. Doherty said this seemed a one-sided bargain. Every property the Corporation bought landed them into a one-sided bargain. He was in favour of the purchase, but he considered the payment required unfair.

Alderman Leech was sorry that Alderman Longdon had painted the picture in too bright colours, because it was certain that the ratepayers would be considerable sufferers. But it should be remembered that this was not an ordinary purchase. When a man bought a house, he became its possessor with but few future advantages. The man only lived for a certain time; but a Corporation lived for ever. The Corporation could afford to wait for future advantages—advantages which had been pretty well pointed out. It would, however, be a grave mistake if it were supposed that in the course of time, with the moderate income they received from the water, they should pay off the sum of £350,000. It must not be supposed they, as a Corporation, were purchasing the Company on such terms that they would pay them off out of the income derived from the water, and in a few years be rid of the debt. They were going to pay the amount off in a limited period, but they should do it with capital and income. He was a Shareholder in the Company, and he did sincerely think the money asked was too much. The fact of compulsory purchase, however, should not be lost sight of. Looking at the whole thing, he could not but say that it was an excellent bargain, and if he lived he should say in effect, though not in words, to the Shareholders, that they were fools if they did not accept it. The Directors might have raised some objections to losing their incomes of £50 or £100 a year, and he half expected that they would have claimed to have their fees capitalized.

The resolution was then put and carried without opposition.

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

A much quieter tone prevails generally throughout the coal trade of this district, consequent upon the falling off in the demand for house-fire classes of fuel; and although the pits, in most cases, are still kept tolerable well employed, short time is beginning to be worked in some cases, and at a few of the collieries stocks are again accumulating. For gas-making coals a few inquiries continue to come into the market, but as they are not for present delivery, colliery proprietors are not sending out quotations upon which it is probable business would be done, and it is not likely that any contracts of importance will be entered into for the next month or two. Common coal for steam and forge purposes meets with no better demand, and burgy and slack are very bad to sell, with the inferior sorts being pushed in the market at extremely low figures. The quoted prices at the pit mouth are about as under:—Best Wigan Arley, for house-fire purposes, 9s. to 10s. per ton; second qualities, 7s. to 8s.; Pemberton four-feet, 7s. 3d. to 7s. 9d.; common round coal, about 6s.; steam and forge coal, 5s. to 5s. 6d.; burgy, 4s. to 4s. 6d.; and slack, 2s. 6d. to 3s. 6d. per ton, with common sorts as low as 2s. per ton.

In the iron trade there is still very little doing, and although sellers of some outside brands are reported to exhibit a rather firmer tone this last day or two, iron generally can be bought at as low a figure as ever, and Lancashire pig is, if anything, rather easier, makers being willing to sell at 1s. per ton under their nominal quotations of 48s. per ton for No. 3 foundry, and 47s. for No. 4 forge, less 2½ per cent., delivered into the Manchester district. Finished iron is very dull, and as there is so much competition for any business, it is difficult to ascertain what are the actual selling prices; but Lancashire bars delivered into the Manchester district could, in some cases, be bought as low as £5 10s. per ton.

THE COAL AND GENERAL TRADE OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

The gas coal steamers were very much kept back last week with south-easterly gales. Some of them, after getting to sea, and a distance on their voyages, were obliged to put back, being unable to contend with the bad weather. It moderated in the latter part of the week; but in some instances a voyage will be lost. Notwithstanding the delay of steamers, the best collieries wrought full time. This week they will go on without hindrance. An idea can be formed of the prospects of the gas coal trade in 1879. The contracts for the year have now all been completed, and the prices struck. The best authorities in the trade state that coals have not been so cheap for twenty years, as these contracts show. The regular price in the open market is 7s. best, less 2½ and 5 per cent.; seconds, 6s., and a little less, with discount. Steam, and house and manufacturing coals are in moderate request. Manufacturing coals are extremely low in price. Some contracts have been made by Continental Gas Companies, within the last few days, for a supply of Durham gas coals over the season. Coke is a little more in request.

The freight market continues to favor shippers. Steamers to load coals for London are paid 4s. per ton; Havre, 5s. 6d.; Rouen, 7s. per ton, which is very low. Sailing vessels, to discharge gas coals at the wharves, have been chartered at—London, 6s.; Exeter (gas), two ships, 8s. 6d. per ton; Plymouth (gas), £7 per keel of 424 cwts. Freights are low all round. Considerable fleets of small sailing vessels, laden with coals, were detained in the Tyne and Wear by contrary winds down to Saturday.

The price of Spanish lead is low. In prosperous times it reached as high as £25 a ton. A fairly good article may be had now at little more than half that price—say, from £12 15s. to £13 per ton. A considerable quantity of Spanish lead is on its passage to this country.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

A large number of members of the Philosophical Society of Glasgow turned out last Wednesday evening to hear Dr. Wallace's lecture on "Gas Illumination." Among the audience there were several of the Corporation Gas Commissioners, the Inspector of Lighting, and a number of Gas Managers, including Mr. W. Foulis, Mr. Dalziel, of Kilmarnock, and Mr. Mitchell, of Coatbridge. The lecture, which was fully illustrated by interesting experiments, was much appreciated, as was also the exhibition of the two large "London" Argands of Mr. Sugg. There is some probability that the Sugg burner and lamp will by-and-by be publicly tested in one or more of the squares and places in the centre of the town, at the instigation of the Lighting Committee of the Town Council.

On the evening of Friday, the 14th inst., Mr. M'Crae tried a very successful experiment in street lighting with gas in Dundee. He arranged the experiment so that in fourteen of the ordinary lamps there should be consumed the usual quantity of gas, with the addition of the quantity required for driving the gas-engine which had been used for several nights previously in connection with the electric light experiments. In each of three lamps there were three No. 6 burners; other five had two of No. 6 each; there was also one with six No. 6 burners; other two lamps had each two No. 8; and two had each two of No. 9 Bray's "Special;" and the remaining one had a Sugg double-flame Argand. The effect was much more satisfactory than that obtained by the electric light.

It is worthy of mention that the Gas Examiner for Cupar-Fife reports as follows on the quality of the gas supplied to that town:—The testings of the gas during the month ending the 13th of February show an average illuminating power of 29·8 standard candles. The Gas Company intend to relay a large proportion of street-mains with new pipes during the ensuing season, as the old ones are found to be too small in many places, and much corroded. Some districts have of late been but sparingly supplied.

Mr. Robert Mitchell, Gas Manager, Coatbridge, gave an interesting lecture on "Coal Gas" last Tuesday to the Young Men's Christian Association of that town. In the course of the lecture he remarked that the Coatbridge Gas Company were formed in 1843, and that for the first year's production 96,000 cubic feet were registered, a quantity which is now consumed in less than twelve hours. He also stated that the year's make of gas in Coatbridge has now reached nearly 40 million cubic feet. One of Sugg's 50-light Argands was shown in actual use during the evening, and the lecturer remarked that it was giving a flame equal to 56 candles, the cost of the gas consumed being only ½d. per hour.

On Saturday forenoon, Dr. E. J. Mills, F.R.S., "Young" Professor of Technical Chemistry, Glasgow, had his students out at the Dawsholm Gas-Works, belonging to the Glasgow Corporation Gas Commissioners, for the purpose of studying the manufacture of gas in connection with a course of lectures now in progress, on "Fuel." They were courteously conducted over the whole of the works by the Station Manager, Mr. Davidson, and subsequently over the adjoining chemical works, where the secondary products are recovered. The make of gas at the time of the visit was at the rate of fully 2 million cubic feet per day, some 250 retorts being in operation. The hydraulic discharging machine was in use, but not the stoking machine devised by Mr. Foulis, the General Manager, and the retorts were charged by shovels, 10½ cwts. serving for each oven of six retorts. All the students felt much pleased with what they saw and heard.

On Friday week there were exposed for sale, by public auction, fifty-six £4 shares in the Stirling Gaslight Company, and they were purchased at the upset price of £4 2s. per share. A lot of 121 shares, that had not previously been advertised, was also put up for sale, but there were no offers. The 9 per cent. Glasgow Corporation gas annuities improved to £209 on Wednesday, and some business was done in them; and on Friday there were transactions in the 6 per cent. annuities, at £167½. The Edinburgh Gas Company's stock changed hands on Thursday at £47½. Business was also done on Wednesday in the Glasgow Corporation 4 per cent. water annuities, at £101.

During a portion of the past week the Glasgow pig iron market was very strong, and a large amount of business was done, prices advancing on Friday to 43s. 6d. one month, and 43s. 5d. cash, and the week's improvement amounting to 7d. per ton. As pig iron is now considered to be a safe investment, and a good speculation at the low prices, warrants are being rapidly bought up for those purposes.

The coal market is practically unchanged. Local trade is even quieter than it was, and the demand for house coal is not at all active.

PONTEFRACT GAS COMPANY.—At the half-yearly meeting of this Company, held last Thursday, the Directors reported that the amount divisible amongst the Shareholders was £1508 8s. 4d., out of which they recommended the payment of a dividend for the half year ending Dec. 31 last, at the rate of 10 per cent. per annum.

REDUCTION IN THE PRICE OF GAS AT BATH.—The Directors of the Bath Gaslight Company have just announced a reduction of 3d. per 1000 cubic feet in the price of gas, to take effect from Christmas last. The price is now, therefore, 2s. 9d. per 1000 feet; and for the public lamps at the rate of 2s. 5d.—the charge being £2 11s. 3d. per lamp per annum, including lighting and extinguishing, cleaning and repairing.

BILSTON GAS COMPANY.—A special meeting of this Company was held last Tuesday—Mr. W. Hatton in the chair—when the following resolution, passed at the annual meeting of the Company last month, was confirmed:—"That the Directors be authorized to further increase the capital of the Company by the issue of 100 debentures of £50 each, increasing the capital of the Company by £5000, to bear interest at the rate of 6 per cent. per annum., the principal to be repayable at the end of five years."

SALE OF GAS SHARES AT WOOLWICH.—At a sale by auction at Woolwich, on the 12th inst., original £10 shares in the Woolwich Equitable Gas Company fetched £22 15s.; original £5 shares in the Woolwich Consumers Gas Company realized £10 17s. 6d. and £11; while a great number of £5 shares of the second issue, paying 7½ per cent. only, were all sold at £8 5s. per share, and £2 paid shares of the fifth issue were eagerly competed for, and bought at £4 and £4 7s. 6d. per share. These latter shares were at par a month ago, and only the previous week some were publicly sold at £3 7s. 6d., which was considered a good price.

LIMERICK GAS SUPPLY.—At the meeting of the Limerick Corporation, on Thursday, the 13th inst., a letter was read from Mr. D. W. Ogg, Secretary of the Limerick Gaslight Company, stating that, with reference to the application of the Town Council to extend the time for the taking over of the gas-works, the Company had been considering their legal position, and, under the circumstances, had decided to refuse the application; but, wishing to act courteously towards the Council, they would extend the time up to the 31st of March next, without prejudice to the existing agreement. A report was brought up from the Gas Committee, strongly urging the Council to accept the offer, as money could be had at a cheap rate of interest just at present, and there would be no difficulty in borrowing the £54,000 necessary to purchase the works. On the motion of Alderman O'Callaghan, J.P., seconded by Mr. John Bernal, the report was unanimously adopted.

SEVENOAKS WATER COMPANY.—The half-yearly meeting of this Company was held on Saturday, the 15th inst.—Mr. M. Lambarde in the chair. The following report of the Directors was read, and a resolution in accordance therewith was carried:—"The Directors have much pleasure in submitting the second half-yearly balance-sheet to the Proprietors, and congratulate them upon the continued success of the Company's business. The water-rental for the year just ended amounts to £2060 2s. 11d., against £1836 0s. 4½d. for the previous year. The profit and loss account shows a net balance of £853 12s. 10d. available for dividends. The Directors will, therefore, recommend a distribution at the rate of 10 per cent. per annum on the consolidated stock, and 7 per cent. on the new capital, both payable on the 1st of March next." The report and balance-sheet were adopted, Messrs W. F. Holcroft and Edwyn Evans Cronk were re-elected Directors, and Mr. Joseph Parker was re-elected Auditor. The meeting closed with the usual compliment to the Chairman.

CLEVELAND WATER-WORKS COMPANY.—The twenty-first half-yearly meeting of this Company was held at Saltburn-by-the-Sea, on Thursday, the 13th inst.—Mr. W. Whitwell in the chair. The report stated that the Directors had resolved to make calls on the B issue of shares, to avoid the renewing of mortgage bonds as they become due; and that the receipts for the half year, including £327 3s. brought forward, were £2931 10s. 8d.; working expenses absorbed, £735 18s. 6d.; preferential interests required £415 11s. 10d.; leaving a net distributable balance of £2107 3s. 4d. The Chairman moved that the report and accounts be adopted, and that a dividend, clear of income-tax, be declared at the rate of £7 5s. per cent. per annum on the original and A shares, and at the rate of £5 1s. 6d. per cent. per annum on the B issue of shares. The motion was seconded by Mr. D. T. Petch, and carried. The retiring Director and Auditor were reappointed. After the transaction of some other routine business, and a general conversation as to the calls on shares and repayment of mortgages, a vote of thanks was awarded to the Chairman and Directors.

MAUBEUGE (FRANCE) GAS COMPANY.—The report and balance-sheet presented at the last general meeting of this Company show that, notwithstanding the great commercial depression that has prevailed in the localities supplied, the Company's affairs have progressed satisfactorily. The gas-works at Dreux have recently been purchased by the Company, who have obtained a concession for the public lighting; and when the extensions contemplated, both at this station and at Maubeuge, have been carried out, and the hoped-for revival in the metallurgic industry takes place, there is little doubt that a considerable augmentation of the Company's profits will result. The total amount realized during the year ending May 31, 1878, from the sale of gas and coke, from meter-rentals, and other sources, including the balance brought forward, was 88,845 frs. (£3354), from which had to be deducted 4192 frs. for the reserve-fund, and 7695 frs. for Directors fees—total, 12,157 frs. (£486)—leaving 71,688 frs. (£2868) for distribution among the Shareholders. This sum allowed of the payment of a dividend of 31 frs. 25 c. (25s.) per share on the original, and 13 frs. (10s. 1d.) on the new shares.

THE PLATINIZATION OF IRON.—The incorrosive nature of platinum is well known, and its application to iron surfaces as a preservative from rust, is a problem which has long engaged the attention of metallurgists, though hitherto without any practical result. Mons. J. B. A. Dodé, an eminent French chemist, claims to have solved this problem. He first paints the iron over with a composition of turpentine, borate of lead, oxide of copper and cobalt, and exposes it for a few minutes to a temperature of about 400°. On cooling, the surface is again painted with a solution of chloride of platinum, combined with essential oils, and the object heated for a second time. When cool, it is found to be covered with a permanent and homogeneous covering of platinum, rendering it impervious to rust, and unaffected by gas, atmospheric changes, and ordinary wear and tear. The gist of the discovery lies in the method of dissolving and holding the platinum in solution, and in applying it direct to the article treated, without any other aid than so low a temperature as not to affect the metal coated. The process, which is eminently applicable to gas-pipes, gaseliers, brackets, sconces, &c., has just been successfully demonstrated in England.

SUTTON-IN-ASHFIELD GAS COMPANY.—The twenty-seventh annual general meeting of this Company was held last Thursday, when the following report was presented:—"The continued and severe depression of the staple trades of the district has prevented so large an accession of new consumers as would, in other and more favourable circumstances, have taken place; but the revenue of the Company nevertheless shows a gratifying increase, and one which may be reasonably expected to be in future much greater. The amount available for dividend, including £302 18s. 7d. brought from last account, is £1168 8s. 5d., out of which the Directors propose to pay a dividend of £1 per share, being at the rate of 10 per cent. per annum, carrying forward £518 8s. 5d. The Local Authority for the district obtained an Act during the past Session of Parliament, for the purchase of the Company's works and undertaking, on the basis of the agreement which had been duly approved by the Shareholders. The date fixed for the completion of the purchase and the transfer of the works was the 31st of December last, but the Local Board, being unable to mature their arrangements, gave the Directors notice to that effect, and the works are still in the possession of the Company, being managed by the Company's Directors for the benefit of the Local Board. Interest at the rate of 5 per cent. per annum upon the purchase-money will be paid from the commencement of the year until the date of completion, which, though not yet fixed, will, it is believed, be before many weeks have passed."

POOLE GAS COMPANY.—On Monday, the 10th inst., the half-yearly meeting of this Company was held—Mr. W. Pearce in the chair. The report stated that the Directors had the satisfaction of informing the Shareholders that, for the first time since the Company had been incorporated and placed under parliamentary regulations, the earnings for the half year had been sufficient to pay the full maximum dividend without being supplemented from any other source. The report went on to say the average cost of coal delivered into the Company's stores for the last six months had been only 15s. per ton, as against 16s. 1½d. for the corresponding half year of 1877, and the quantity of gas made from a ton of coal in the last half year had been 9750 cubic feet, as against 9630 in the former half. The Directors mentioned the extensive improvements and enlargements in the works which were being carried out, and they then said that at their last meeting they took power to raise by debentures a further sum of £2000, of which amount, in the month of October last, a sum of £1000 was raised at 5 per cent., upon the condition that interest should not commence until the beginning of the present year. The other £1000 was now urgently required, to pay off existing claims and meet coming liabilities; so the Directors proposed to call it up at once. The Chairman moved the adoption of the report, and the proposition, seconded by Mr. W. Penney, was carried unanimously. A dividend at the rate of 10 per cent. on the A shares, and 4 per cent. on the B shares, was declared, payable on the 25th of March. Messrs. W. L. Adey and G. H. Gutch were re-elected Directors, and Mr. E. N. Blanchard was chosen a Director in the place of Mr. J. B. Justican, who had retired owing to ill-health. Mr. William Livesey was reappointed Auditor, and the usual votes of thanks were passed.

Lecture on Gas at Worthing.—On Tuesday, the 11th inst., a lecture on Gas was given at the Worthing Literary Institution, by Mr. J. Richmond, Manager of the Worthing Gas-Works. The lecturer treated his subject under three heads—the discovery, the history, and the manufacture of gas. In connection with the second part of the lecture, he referred to the advantage of gas over oil for street lighting, and said police officers had shown that gas was a preventive of crime. It was highly essential, he maintained, that gas should remain burning in the public streets throughout the night, and he commended this remark to the consideration of the Local Authority. He then traced the history of the Worthing Gas-Works, which were established in 1832. The number of public lamps put up at that period was 120; but he could find no record to show what impression the introduction of gas made upon the minds of the people of Worthing. After showing the great increase in the quantity of gas manufactured at Worthing, he left the local connection with the subject, and gave an extremely interesting account of the history of gas manufacture in this and other countries. In a clear manner, making use of few, if any technical terms, the lecturer described the process of gas manufacture, and then went on to trace it to the homes of consumers, at which point he gave many useful hints as to the best burners to be obtained, and as to the use of gas for purposes of cooking. A gasholder, lamps, gas-stoves, &c., served to illustrate the concluding remarks of the lecturer, who was listened to with great attention. A vote of thanks to Mr. Richmond was passed at the close of the lecture.

Gas in Railway Carriages.—The system of lighting railway carriages by gas seems to be coming more and more into general use in Germany. According to a recent number of the *Journal für Gasbeleuchtung*, the Prussian Minister of Commerce has ordered the general adoption of this system on the Government lines, especially on the Eastern Railway, for the supply of which, in addition to the extensive gas-works already existing at Eydtkuhnen, others will be erected at the Dirschau station. According to the report of a meeting of German Railway Engineers, held a short time since at Stuttgart, the present extended use of gas for railway carriage lighting has excited considerable interest. On some of the principal lines there are now altogether 3654 carriages lighted with gas, being rather over 17 per cent. of the entire number in use. On the "Berlin to Dresden" line it is exclusively employed, and the other lines are contemplating its general introduction. A very favourable opinion of this system of lighting the carriages is expressed, the quality and steadiness of the light, together with its cleanliness and safety in use, being regarded as great points in its favour. The system is being adopted on the Potsdam to Magdeburg, and also on the Bavarian lines, which, together, have 2329 passenger carriages. On some two dozen branch lines, rape-seed oil is the illuminating material used at the present time, gas being employed on the Brunswick line for express trains only; and on five branches, composite candles are in use. The latter mode of lighting has superseded that by rape-seed oil, in consequence of the oil becoming congealed when the temperature happens to be low. On three branch lines highly-refined petroleum oil, burned in open lamps, is used for railway carriage lighting.

Leominster Gas and Coke Company, Limited.—The thirty-first half yearly meeting of this Company was held last Tuesday, when the Directors presented a very satisfactory report, as follows:—"The accounts of the Company for the year 1878 show a balance to the credit of the profit and loss account of £486 8s. 11d. The Directors recommend the payment of a dividend at the usual rates of 10 per cent. per annum on the original shares, and 7 per cent. per annum on the B shares, for the half year ending the 31st of December last. They also recommend the payment of an additional dividend of 2 per cent. on the original shares, in order to make up the dividend for the half year ending December, 1873, to its full legal amount. The Shareholders will then have received dividends at the maximum rates to which they are entitled, from July 1, 1873—on which date the Provisional Order of the Company came into operation—up to the present time. The balance to be carried forward will be £98 18s. 11d. The consumption of gas by private consumers in 1878 was 8,077,200 feet, being an increase of 349,000 feet on 1877, or at the rate of about 4½ per cent. per annum. In view of the fall in the price of coal, the Directors thought it expedient to make a reduction of 5d.—viz., from 4s. 7d. to 4s. 2d. per 1000 feet in the price of gas on the 1st of July last, and they look forward to a further reduction at a future time. Whilst there appears to be no reason to suppose that gas will be superseded by any other agent as a mode of ordinary illumination, it is evident that everything which tends to make it more agreeable or economical to the consumer strengthens the position of the manufacture. The accumulated stock of coke has been completely cleared off, but the price continues to be low. The Directors have had again under consideration the erection of an exhauster and washer, which will probably be proceeded with in the course of the present year."

Bromsgrove Gas Company.—The tenth annual meeting of this Company was held on Monday, the 10th inst.—Mr. Jefferies in the chair. The Secretary (Mr. H. Wright) read the report, which stated that the works, mains, and plant were in excellent condition, considerable expense having been incurred in replacing the retorts and carrying out the other necessary renewals of plant. The balance-sheet and profit and loss account showed an available balance of £675, with which it was proposed to pay a dividend of 7½ per cent. The retiring Directors, Messrs. Wm. Bolding and Wm. Frances, and the Auditor, Mr. Gosling, offered themselves for re-election. In moving the adoption of the report, the Chairman referred to the fact that the Company were not paying so large a dividend as usual, which was due to the extraordinary expenditure on the renewal of the retorts, and the reduction in the assessment of the value of the old stock upon the works. He stated that the Directors, under present circumstances, wished no remuneration this year for their services, and informed the Shareholders that, at their last meeting, it was decided to reduce the price of gas from 5s. to 4s. 7d. per 1000 feet, and that all consumers of over 5000 feet per annum be allowed a discount of 5 per cent. for payment within a month of the presentation of the accounts. The report was adopted. The balance-sheet showed total liabilities of £10,455 14s. The assets comprised: Works, plant, and property, valued at £8091 11s. 11d.; preliminary expenses, £60; accounts owing for gas, £1142 2s. 1d.; stock, including meters, &c., £1162. The profit and loss account showed an expenditure of £2762 0s. 11d., including the dividend. The amount received for gas sold, fittings, and rent, during the year, was £2756 15s. 8d., and the sum of £5 5s. 3d. was transferred from the reserve-fund to meet the dividend, which amounted to £675. It was resolved to pay a dividend of 7½ per cent. on and after the 1st day of March next. The retiring Directors and Auditor were re-elected, and the meeting closed with votes of thanks to the Directors, Secretary, and Manager.

Register of New Patents.

APPLICATIONS FOR LETTERS PATENT.

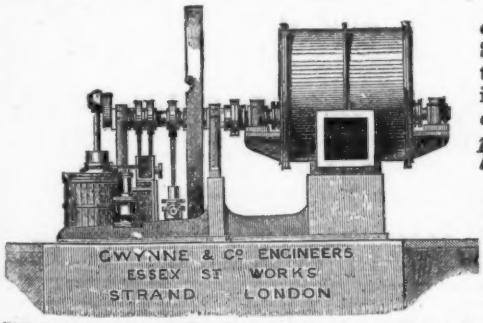
586.—Barker, G., Birmingham, "Improvements in gasholders and gasometers." Feb. 14, 1879.
588.—Wakefield, J., and Fisher, W. E., Birmingham, "Improvements in lamps." Feb. 14, 1879.
594.—Brewer, E. G., Chancery Lane, London, "Improvements in apparatus for the manufacture of hydrogen gas." A communication. Feb. 14, 1879.
609.—Broadfoot, J., Glasgow, "Improvements in pumps." Feb. 15, 1879.
629.—Mason, H. E. N., and Price, J., Birmingham, "An improvement in or addition to certain kinds of gas-burners." Feb. 17, 1879.
637.—Cherry, W. P. and C. E., Kingston-upon-Hull, Yorks, "Improvements in lamp-burners." Feb. 17, 1879.
684.—Wier, M. A., Shepherd's Bush, London, "Improved means and apparatus for producing light by electricity." Feb. 20, 1879.
692.—Torkington, C., jun., Heys, J., King's Norton, Worcester, Torkington, J., and Mountain, C. G., Birmingham, "Improvements in apparatus for regulating the supply of water to steam boilers, part of which improvements may also be applied to the regulation of the supply of water and other liquids to tanks and other receptacles." Feb. 20, 1879.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

3445.—Siebert, O., Leicester Square, London, "Improvements in gas-light apparatus, and arrangements connected therewith." Aug. 30, 1878.
4170.—Copley, J. C., Nottingham, "An improved process for rendering water permanently hard." Oct. 19, 1878.
4539.—Preston, F. P., Prestige, J. T., Preston, E. J., and Simmons, W. G., Deptford, Kent, "Improvements in apparatus for measuring, regulating, controlling, and arresting the flow of fluids." Nov. 8, 1878.
4705.—Cheesebrough, F. J., Liverpool, "An improved method or system of distributing, dividing, regulating, controlling, and measuring electric currents, in the practical application of the same to electric lighting and other useful purposes." A communication. Nov. 19, 1878.
4949.—Siemens, C. W., Westminster, "Improvements in electric lamps." A communication. Dec. 4, 1878.
4960.—Newton, A. V., Chancery Lane, London, "Improvements in apparatus for generating electric currents, and for producing electric light." A communication. Dec. 4, 1878.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION, TWO MEDALS at the PHILADELPHIA EXHIBITION and TWO MEDALS at the PARIS EXHIBITION, have been AWARDED to GWYNNE & CO. for GAS-EXHAUSTERS, ENGINES, and PUMPS; Also 27 OTHER MEDALS AWARDED at all the GREAT INTERNATIONAL EXHIBITIONS.

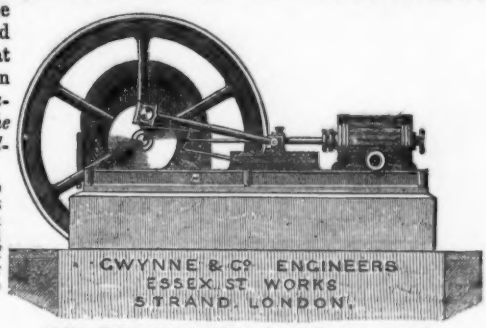
GWYNNE & BEALE'S PATENT GAS-EXHAUSTERS & ENGINES.



EXHAUSTER with Trunk Engine, capable of passing 210,000 cubic feet per hour.

The Judges report on the combined Exhauster and Steam-Engine exhibited at the Philadelphia Exhibition is—"*Reliable compact Machine, well adapted for the purpose intended, of excellent workmanship.*"

GWYNNE & CO. have made the largest and most perfect Gas-Exhausting Machinery in the world, and have completed Exhausters to the extent of 8,000,000 cubic feet passed per hour, of all sizes from 2000 to 210,000 cubic feet per hour.



52,500 EXHAUSTER, with Horisontal Engine combined.

GWYNNE & CO. do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, *but to produce machinery of the very highest quality, and most approved design and workmanship.* The result is that in every instance their work is giving the fullest satisfaction. Numerous testimonials and references can be given to Companies using their Machinery for years past.

Exhausters, with or without Engines combined, can be made to pass the gas WITHOUT OSCILLATION OR VARIATION IN PRESSURE Regulators, Bye-Passes, Stop-Valves, Gas-Valves, Station Governors, and Gas Machinery of all Sizes.

PLEASE ADDRESS IN FULL, GWYNNE & CO., Hydraulic and Gas Engineers, ESSEX STREET WORKS, VICTORIA EMBANKMENT, LONDON, W.C., ENGLAND.

Gwynne & Co.'s New Catalogue on Gas-Exhausting and other Machinery may be obtained on application at the above Address.

WANTED, Two leading Stokers, used to Scoop Work. Wages 30s. per week. To steady men constant employment can be given.
Apply to MANAGER, Gas-Works, WINCHESTER.

WANTED, by a young Man, aged 23, who has had five years experience in a Provincial Works (make, 75 millions), a SITUATION in a Gas-Works. Can use Photometer, fair Draughtsman, good Writer, quick at figures, and thoroughly understands general routine.
Address No. 527, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a Situation as Gas Manager. Had over 20 years experience, and 8¼ years in present employment. Understands all branches connected therewith. Good testimonials. Satisfactory reason for change.
Address No. 522, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by the Advertiser, a Situation as FITTER, Main and Service Layer, and Meter Inspector, or the Management of Works. Has a thorough knowledge of the whole routine of Gas-Works, having had many years experience.
Address No. 528, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by a Young Man (married), a Situation as MANAGER, or Secretary and Manager, of a small Gas-Works, or Assistant in a larger one. Has had considerable experience in the Manufacture and Distribution of Gas in all its branches; five years sole Manager. No objection to any place in the United Kingdom. Satisfactory reasons for change. Unexceptional references and testimonials.
Address, in first instance, No. 526, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WEIGHTS AND MEASURES ACT.

LYON'S Patent Weighing, Measuring, and Registering Machines. Respectable Agents Wanted.
Address ARNOLD E. ROBINSON, City Buildings, Corporation Street, MANCHESTER.

THE Coatbridge Gas Company have the following PLANT FOR SALE, the whole of which is in thorough good working order, and is brought into the market in consequence of new works having been erected on a larger scale:—

24	D-shaped Mouthpieces		1 ft.	10 in.	by 1 ft.	
4	,,	,,	1	6	1	1 in.
4	,,	,,	1	6	1	1 with side Branches.
4	,,	,,	1	5 in.	by 1 ft.	
4	Round ,,		1	2	diameter.	

All with Connections complete.
108 ft. cast-iron Hydraulic Main 1 ft. 10 in. by 1 ft. 8 in.
1 Tar Chest, 16 ft. by 3 ft. by 3 ft.
1 Battery Condenser, 16 ft. 6 in. by 7 ft. by 2 ft.
1 Washer, 6 ft. by 3 ft. by 2 ft. 6 in. and 3 ft. by 3 ft. by 3 ft.
Exhauster, by Whimster, 9 in. Connections, with Bye-pass.
Engine of 6-horse power and Pumps combined.
Four Purifiers 8 ft. by 12 ft., with 3 sets cast-iron Sieves and Valves complete.
Station-Meter, 6000 ft. per hour, by Milne.
One 9 in. Governor, by Peebles.
One Gasholder, 70 ft. by 20 ft.
One ,, 40 12
For further particulars apply to Mr. ROBERT MITCHELL, Manager, Gas-Works, Coatbridge,
Feb. 12, 1879.

WANTED, a good Working Foreman in a Gas-Works (highest winter make 30,000 per week). Must thoroughly understand Stoking and Purifying, and be able to Lay Mains, Services, &c. Good references required.
Apply, stating particulars, to the MANAGER, Gas-Works, HAVANT.

WANTED, by the Swindon Gas and Coke Company, a Secretary and Manager for their Gas-Works, producing about 9 millions per annum. He must have a thorough knowledge of everything connected with the Manufacture and Sale of Gas, Laying Mains and Services, the Inspection of Meters, &c.; be able to keep the books of the Company (by double entry), and take the minutes of the Directors meetings. Salary £100 per annum, with house, coal, and gas free. He will be required to enter upon the duties of the situation on May 12, 1879.
Applications, in writing, with testimonials, and stating the age of the applicant, number in family, and present situation, to be sent to me on or before March 3, 1879,
HENRY HUNT.
Gas-Works, Swindon, Feb. 15, 1879.

BOROUGH OF HALIFAX.

TO BRASS AND IRON FOUNDERS.

THE Gas-Works Committee of the Halifax Corporation invite TENDERS for the Supply of Brass GAS-COCKS and Wrought-Iron TUBING for a period of Twelve months.
Forms of tender and further information may be obtained on application to Mr. Wm. Carr, Engineer, Gas-Works, Halifax.
Tenders, properly endorsed, must be sent to me on or before Thursday, the 6th of March next.
By order,
A. C. FOSTER, Town Clerk.
Town Hall, Halifax, Feb. 21, 1879.

BOROUGH OF HALIFAX.

EXHIBITION OF GAS-STOVES, ENGINES, BURNERS, &c.

THE Gas Committee of the Halifax Corporation having decided to hold an Exhibition of all kinds of Appliances for the Economic Use of Gas for Domestic and other Purposes, they will be glad to receive applications from Engineers and Manufacturers who desire to exhibit. It is intended to hold the exhibition during the first week in April; room, gas, and connections being provided by the Gas Committee.
Printed forms of conditions may be had from the undersigned, and all applications for space, from parties wishing to exhibit, must be made to me on or before the 15th of March.
WM. CARR, Engineer and Manager.
Halifax, Feb. 17, 1879.

EXETER GASLIGHT AND COKE COMPANY.

TO CONTRACTORS.

THE Directors of the above Company are prepared to receive TENDERS for two 24 ft. square PURIFIERS, also two 20 by 16 ft.
Further particulars may be obtained on application to the Engineer at the Basin Gas-Works, and sealed tenders to be sent to me, the undersigned, on or before Saturday, the 15th day of March next.
The Directors do not pledge themselves to accept the lowest or any tender.
By order,
W. A. PADFIELD, Secretary.
Gaslight Offices, Exeter, Feb. 20, 1879.

EXETER GASLIGHT AND COKE COMPANY.

AMMONIACAL LIQUOR—EXTENSION OF TIME.

THE Directors of the Exeter Gaslight and Coke Company having received applications for an Extension of the Time of Contract, are now prepared to receive TENDERS for either One, Three, or Five years, from the 25th of March next.
Contractors to state price, at per 1000 gallons of 6 degrees Twaddell, and the extra price they are prepared to give for every additional half Twaddell strength of liquor, delivered into tank at the Company's Works; and sealed tenders, endorsed "Tender for Ammoniacal Liquor," to be sent to me (the undersigned), on or before Saturday, the 1st of March next.
The Directors do not pledge themselves to accept the highest or any tender.
By order,
W. A. PADFIELD, Secretary.
Gaslight Offices, Exeter, Feb. 13, 1879.

TENDERS FOR ALTERATION OF AND ADDITIONS TO GAS SCRUBBERS.

THE Gas Committee of the St. Helen's Corporation invite TENDERS for the Alteration and Enlargement of Two Scrubbers, now erected at the St. Helen's Gas-Works, from their present size—viz.: 24 ft. high by 8 ft. diameter, to 48 ft. high.
To be filled with Boards, and provided with Machinery-Room, Water Distributor, Spiral Staircase, &c., as per plans and specifications; which may be seen, and all necessary information obtained, from the Engineer upon the Works.
Sealed tenders, endorsed "Tender for Scrubbers," and addressed to the Chairman of the Gas Committee, to be delivered to the undersigned, at the Gas Office, Warrington Old Road, St. Helen's, not later than Monday, the 10th day of March.
The Committee do not bind themselves to accept the lowest or any tender.
By order,
E. DYSON, Secretary.

TENDERS FOR GAS COAL AND CANNEL.

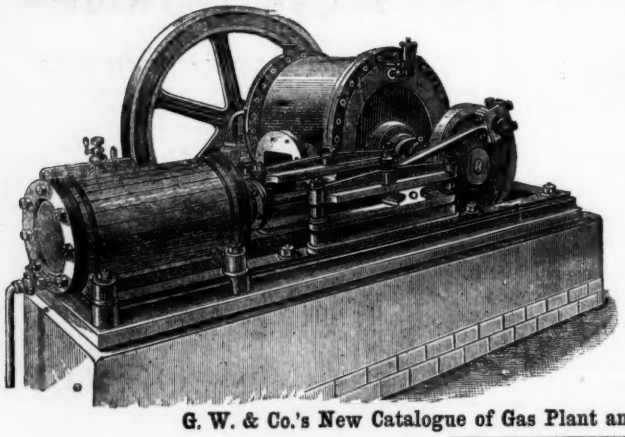
THE Gas Committee of the St. Helen's Corporation invite TENDERS for a One and Two years Supply of GAS COAL and CANNEL from the 1st of July next—viz.:
For the year ending June 30, 1880—
6000 tons of Coal and 4400 tons of Cannel.
For the year ending June 30, 1881—
7500 tons of Coal and 4600 tons of Cannel.
The monthly deliveries of coal not to exceed 1200 tons or to be less than 300 tons, and the monthly deliveries of cannel must not exceed 700 tons, or be less than 240 tons.
To be delivered at the Gas-Works, St. Helen's (into which there is a siding from the London and North-Western Railway), in such weekly quantities as may from time to time be specified, in writing, by the Manager of the Gas-Works.
The coal and cannel to be the best of their respective kinds; to be well screened and free from all dirt and refuse.
Sealed tenders, stating the net price per ton for each period, properly endorsed, and addressed to the Chairman of the Gas Committee, to be delivered to the undersigned, with an analysis of the coal and cannel offered, not later than Monday, the 10th day of March.
The Committee do not bind themselves to accept the lowest or any tender.
By order,
EDWARD DYSON, Secretary.
Gas Office, Warrington Old Road,
St. Helen's, Feb. 19, 1879.

BEALE'S IMPROVED PATENT GAS EXHAUSTERS

WITH

Wrought-Iron Spindles and

ENGINES COMBINED.



SOLE MAKERS,

GEORGE WALLER & CO.

**MAKERS OF ENGINES, EXHAUSTERS,
INDEX AND DISC GAS-VALVES,
HYDRAULIC MAIN VALVES,
BYE-PASS VALVES,
TAR, LIQUOR, AND OTHER PUMPS,
SCRUBBERS AND PURIFIERS,
CONDENSERS, BOILERS, &c.**

G. W. & Co.'s New Catalogue of Gas Plant and Machinery can be had on application.

Phœnix Engineering Works:

HOLLAND STREET, SOUTHWARK, S.E.

TO GAS ENGINEERS.

D. BRUCE PEEBLES & CO.

Beg to call the attention of Gas Engineers to the fact that the novel and original feature in connection with PEEBLES' SYSTEM OF CONTROLLING THE ACTION OF GAS GOVERNORS is the loading or acting on the Bell by Pneumatic Pressure instead of Weights.

TAY WORKS, BONNINGTON, EDINBURGH.

WESTON-SUPER-MARE GASLIGHT AND COKE COMPANY.

TO BE SOLD BY TENDER, a quantity of GAS PLANT suitable for a medium-sized Gas-Works, consisting of a 30 ft. Gasholder, together with one Station-Meter. Capacity, 5000 ft. per hour, with three 6-in. Valves and connections complete.

Set of Six PURIFIERS, 9 ft. by 6 ft., and 3 ft. 6 in. deep, with Trays and two Centre Valves complete. Two Columns, two Guides, and frame belonging thereto.

One SCRUBBER, 8 ft. by 7 ft., with Iron Trays, Centre Table, and other necessary connections.

One 8-in. GOVERNOR, and also a quantity of piping and other miscellaneous articles.

The above are to be disposed of in consequence of recent extension and enlargement of the works.

Tenders to be sent addressed to the Secretary, and the Directors do not pledge themselves to accept the lowest or any tender

For further particulars apply to Mr. John Perry, Manager, or to W. H. Davies, Solicitor, Secretary.

GODALMING GAS-WORKS.

A Set of three 6 ft. square Purifiers, Sieves, Lifting Gear, and Centre Valves, all complete, in good condition, and has been in full work up to last summer, made by Cockey and Son, Engineers, Frome, is now for Sale cheap. Larger ones having been erected, is the cause of their being sold.

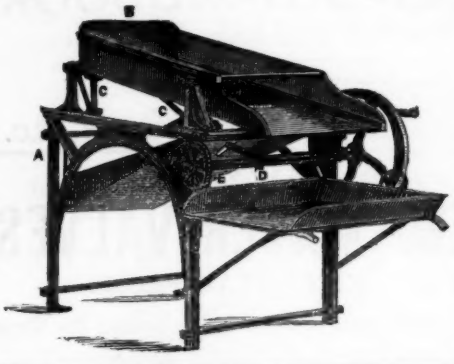
For further particulars, apply to Mr. A. Colfus, Gas-Works, Godalming.

TENDERS FOR TAR AND AMMONIACAL LIQUOR

THE Directors of the Mirfield Gas Company, Ravensthorpe, are prepared to receive TENDERS for the TAR and AMMONIACAL LIQUOR produced at their Works for One year, from April 1, 1879, to March 31, 1880. Coals carbonized, about 5000 tons per annum.

Tenders to be sent in at per ton, separately, not later than Monday, the 3rd of March, endorsed "Tender for Tar," or "Ammoniacal Liquor," to

Samuel Day, Secretary.



PRICE'S PATENT

LABOUR-SAVING SCREEN OR SIFTER.

In screening breeze, the coarse material falls on a tray supported by the handles of the Machine, thus making it convenient for picking the clinkers from the same, whilst the fine falls on a shoot behind, which is fixed to the bottom of the sieve B. In screening gravel or other material, the coarse will fall into a barrow direct, and the fine be conveyed by the shoot into a barrow at the other end, or at the bottom.

To practical men the advantages of this Machine will be evident. It secures at once a saving of time, labour, and expense, as by it a much greater quantity of material can be sifted in the same space of time.

Further particulars as to price, &c., may be obtained by applying to the Patentee (Hampton Wick), or to

ROBERT DEMPSTER & SONS,
(Sole Manufacturers),
ELLAND, near HALIFAX.

ANDREW & JAMES STEWART,
CLYDE TUBE WORKS, GLASGOW & COATBRIDGE.
OFFICES AND WAREHOUSE: 41, OSWALD STREET, GLASGOW.

WROUGHT-IRON TUBES AND FITTINGS
FOR GAS, STEAM, AND WATER.
Hot Water Tubes, Core Bars, Lap-welded Iron Boiler Tubes.
CAST-IRON PIPES for GAS & WATER.
Brass and Gun-Metal Fittings, Valves, Cutting and Screwing Tools, &c.

PATENT

MACHINE-MADE RETORTS.

B. GIBBONS, Jun.,

STOURBRIDGE.

ALLIANCE AND DUBLIN CONSUMERS GAS COMPANY.

THE Directors of this Company are prepared to receive TENDERS for the TAR produced at the Dublin Works, the quantity being about 800,000 gallons per annum. The contract to be for Three or Five years, to commence on March 1, 1880.

Further information can be obtained on application to the undersigned, with whom tenders are to be lodged on or before Tuesday, the 25th inst., endorsed "Tender for Tar."

W. F. Cotton, Secretary and Manager.
Offices, 114, Grafton Street, Dublin,
Feb. 6, 1879.

BOROUGH OF FROME WATER-WORKS.

THE Local Board for the district of Frome, acting as the Urban Sanitary Authority, are prepared to receive TENDERS for the Execution of the following Works at or near Frome, in Somersetshire:—

Contract No. 2.—The Laying and Jointing of about 19,000 yards of Cast-Iron Main-Pipes, varying from 10 inches to 3 inches diameter.

Contract No. 3.—The Manufacture and Erection of Two High-Pressure Condensing Steam-Engines, with Boilers, Pumps, and other appurtenances.

Specifications and forms of tender, as well as bills of quantities for contract No. 2, can be obtained (on payment of one guinea for each contract, which will be returned on receipt of a *bonâ fide* tender), and drawings, relating to contract No. 2, can be seen at my Office in Frome, or at the Office of the Engineer, Mr. Henry Tomlison, 4, Bene't Street, Cambridge; and sealed tenders endorsed respectively, "Tender for Laying Pipes," or "Tender for Pumping Machinery," as the case may be, must be delivered to me not later than Twelve o'clock at noon on Wednesday, the 5th day of March next.

The Board do not bind themselves to accept the lowest or any tender.

Geo. W. Bradbury, Clerk to the Board.
Bath Street, Frome, Somerset, Feb. 18, 1879.

IMPERIAL CONTINENTAL GAS ASSOCIATION.

NOTICE is hereby given that an EXTRAORDINARY MEETING of the PROPRIETORS of the Imperial Continental Gas Association will be held at the City Terminus Hotel, Cannon Street, in the City of London, on THURSDAY, the 13th day of March next, at Two o'clock in the afternoon, for the purpose of considering the provisions of the Bill now before Parliament, entituled "A Bill for Empowering the Imperial Continental Gas Association to supply means of Lighting other than Gas, and for other purposes."

At such meeting the said Bill will be submitted for the consideration and approval of the Proprietors.

Dated this 24th day of February, 1879.

Albert F. Jackson,
Secretary of the Association.

HARROW DISTRICT GAS COMPANY.

NOTICE is hereby given that the ORDINARY HALF-YEARLY MEETING of this Company will be held at the Guildhall Tavern, 1, Gresham Street, in the City of London, at One o'clock, on Monday, March 10, 1879, to receive the Directors and Auditors reports, to declare a Dividend, to elect two Directors and an Auditor, and to transact any other ordinary business of the Company.

The Transfer Books will be closed from the 3rd of March until after the meeting.

By order of the Board,
J. L. Chapman, Secretary.
Office, Gas-Works, Harrow, Feb. 22, 1879.

BRAY'S

NEW BURNER,

80-Candle Power.

See Page 289.

ECONOMY IN THE PRODUCTION OF GAS.

PLUTONIC CEMENT,

For Jointing and Repairing Retorts and Ovens *in* Action and *out* of Action.

A Pamphlet on the advantages of the above, with Modes of Application, References, Prices, &c., free by post, from the Sole Manufacturer,
WILLIAM RICHARDSON, Gas and Hydraulic Engineer, CHARLES HENRY STREET, and BISSELL STREET, BIRMINGHAM.

Now Ready, Price One Guinea,

PRECEDENTS IN PRIVATE BILL LEGISLATION
AFFECTING GAS AND WATER UNDERTAKINGS.

Compiled by Mr. G. W. STEVENSON, C.E., F.G.S.

This Work contains information with regard to the practice of Parliament during the last fourteen years, in regard to most of the points on which differences arise in Opposed Bills for Gas and Water Undertakings, comprising—Authorized share and loan capital, Rates of dividend, Capitalization of profits, Term for the repayment of loans, Instances in which new shares are to be sold by auction and Exceptions to the Standing Order requiring new shares to be sold by auction, The limitation of back dividends, Illuminating power, Purity, Price, Notice before testing, The conditions under which the public supply of gas is regulated, Alteration of mains, Instances in which maps of mains are required, and All cases in which undertakings have been transferred, since 1845 in gas and 1865 in water, from Companies to Local Authorities.

In the Water Precedents will be found, in addition, The rates for a supply for domestic purposes, and the Rates for other than domestic purposes.

LONDON: WALTER KING, 11, BOLT COURT, FLEET STREET, E.C.

WANTED, Readers of the NEW Edition, 1879, "Cooking & Heating by Gas;" on Burners, &c. Copies, by post, Threepence, direct from the Author, MAGNUS OHREN, A.I.C.E., Gas-Works, SYDENHAM, S.E.

WANTED, by Samuel Thompson & Co., Colliery Office, Lancaster, APPLICATION for PRICES from Gas Managers who are prepared to receive Tenders for GAS COAL or CANNEL.

John Leigh, Esq., M.R.C.S., F.C.S., &c. &c., in his analytical report of S. T. & Co.'s Coal, says: "It is remarkable for its purity, I have scarcely ever examined a Coal containing so small a quantity of ash, and when Cannel of the best description is scarce, it may well replace this material."

MESSRS. WRENN & Co., Financial Agents, Auctioneers, &c., will be happy to negotiate for the Sale or Purchase of Gas, Docks, Water-Works, Canal and other securities on moderate terms. Periodical Sales by Public Auction, where equitable prices can be ensured. Holders of Local Provincial Gas and Water Shares are respectfully solicited to communicate with the above at their offices, 4, Copthall Chambers, LOTHBURY.

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Further particulars, &c., upon application to WILLIAM WHITE, Gas-Works, Abersychan, MON.

A Pamphlet descriptive of the above method, post free, 6½d.

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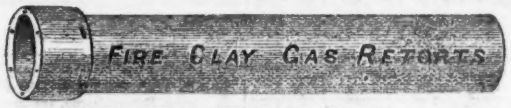

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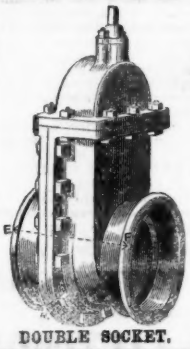

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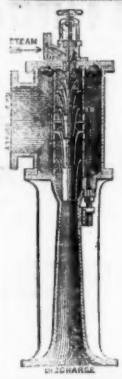

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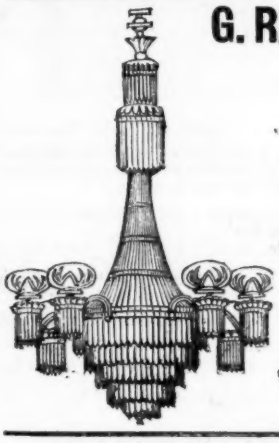

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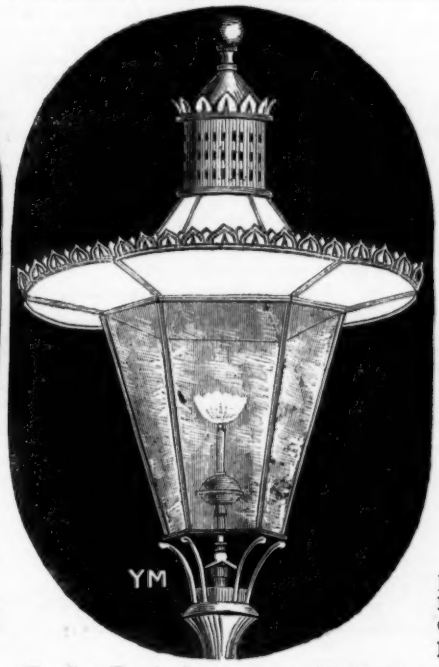
They are strongly recommended for **Railway Platforms and large open spaces,** or any places requiring a good light at a comparative small cost for gas.

The 14-inch square Lamp is made to fit the ordinary Lamp-Cradle now in use, and is fitted with a 24-inch Reflector.

They are made in various sizes and designs—circular, hexagonal, or square.

Where Argand burners are preferred, these Lamps are constructed with effectual Wind-Guards.



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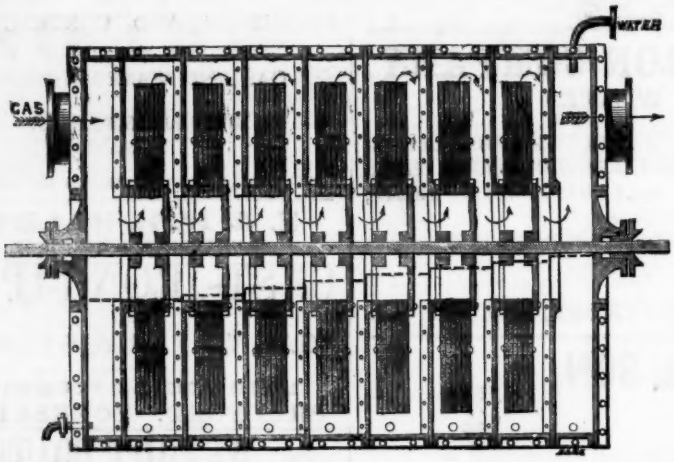
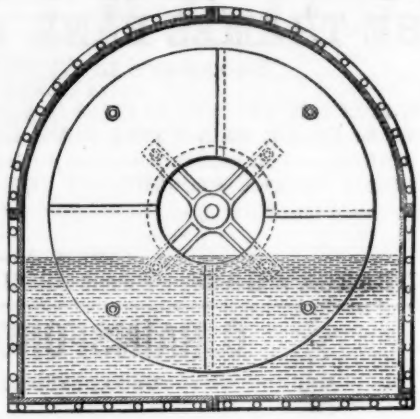
STANDARD WASHER AND SCRUBBER.

[KIRKHAM, HULETT, AND CHANDLER'S PATENT.]





This Washer and Scrubber has been used for nearly two years on a large scale at the Works of The Gaslight and Coke Company, Bromley-by-Bow, at which station there are now several in operation and in course of construction. There is also one in use at the Pancras Station, King's Cross, of the same Company, which is purifying 1,500,000 cubic feet of gas per day. At the Gas-Works of the Corporation of Leeds, a large one has been erected, which is giving complete satisfaction. The Special Merits of this Washer are as follows:—

That it is a very effective Condenser, so that it is not absolutely necessary to reduce the temperature of the gas to 60°, or thereabouts, to make the Washer effective.

That the distribution of the liquor is made with unerring regularity.

That it occupies very small space, so that it can be, at little expense, effectually protected from extreme changes of the weather.

That the considerable expense of Coke or Wood, or other Scrubbing Material, is entirely saved, and that the great nuisance and cost of from time to time replacing the Scrubbing Material is avoided.

That by the revolution of the discs, the quantity of water carried up by them, and tending continuously to fall, exposes a very large amount of fresh wetted surface to contact with the gas.

That it is particularly adapted for Gas-Works where Sulphate of Ammonia is manufactured.

That it is much cheaper than any other Scrubber that will do the same amount of work effectually.

That it is the only Washer suitable for purifying Gas from all its impurities by solution.

That it works with a minimum of pressure.

That it takes out every trace of Ammonia from the Gas in traversing the machines.

That it requires very little outlay for foundations.

The following Testimonials show the opinion of eminent Engineers as to the capabilities of the Washer:—

(Copy.) *The Gaslight and Coke Company*
D. HULETT, Esq. *Bromley-by-Bow, May* 3, 1879.

Dear Sir,—In answer to your inquiries respecting the results of the working of your Patent Washer, I beg to state that I find it a very efficient machine. I have had it in operation for some time, and passed gas through it continuously at the rate of 100,000 cubic feet per hour, and obtained from it 11 gallons of 10 oz. liquor per ton of coal carbonized—results which appear to me very satisfactory for so small a Washer. It works very smoothly, taking but little power, and giving no pressure. I have it still in operation, and am perfectly satisfied with its working.

I am, dear Sir, yours truly, (Signed) W. B. WRIGHT.

(Copy.) *The Leeds Corporation Gas-Works,*
Messrs. KIRKHAM, HULETT, and CHANDLER. *York Street, Leeds, Dec.* 6, 1878.

Gentlemen,—The Scrubber-Washer erected by you at these works, and which has been in use for six months, has proved to be, so far as we have been able to test it, thoroughly efficient. We are at present making 32,000 feet of gas per hour, and are entirely dependent on this apparatus for the removal of Ammonia, and the **Gas is perfectly free from that impurity in the sixth chamber,** so that four chambers remain to deal with an increasing make of gas. Owing to insufficient condensers, the gas was in the summer admitted to the Scrubber at a temperature of 70°, but was reduced therein to 61°, or that of the atmosphere. The volutes are driven at the rate of four revolutions per minute, and, working at that speed, there is not the slightest difference between the inlet and the outlet pressure. Clean water supplied at the rate of 10 gallons per ton of coal carbonized is converted into liquor of from 10 oz. to 13 oz. strength **in once traversing the vessel.** The apparatus is extremely simple and compact, occupies but little space, and requires no foundation. I shall be surprised if it does not eventually become extremely popular.

I am, Gentlemen, yours faithfully, (Signed) HENRY WOODALL, Engineer.

(Copy.) *The Gaslight and Coke Company.*
Messrs. KIRKHAM, HULETT, and CHANDLER. *York Road, King's Cross, Jan.* 14, 1879.

Gentlemen,—In reply to your inquiry, I am pleased to say, the Washer which was put in action at this station in October last has quite fulfilled my expectations, as it confirms the experiments I made in May last with the smaller machine. Working at four revolutions per minute, **it takes out every particle of Ammonia,** while purifying more Gas than it was intended to do. I enclose particulars of a fortnight's working during our heaviest make, by which you will see that it yields the full quantity and strength of liquor, and works with little pressure. I am therefore quite satisfied with the machine, and trust it may meet with the success it deserves.

I remain, Gentlemen, yours truly, (Signed) JOHN CLARK.

The following Table shows the results of the working of one of these Washers, lately erected to purify 60,000 *feet of Gas per Hour, at the St. Pancras Station of The Gaslight and Coke Company:—*

1879.	Nos. of the Divisions and Strength of Liquor in each.										Water used per Ton of Coals.	Gas Purified per Hour, Cubic Feet.	Ammonia on Outlet.	Temperature.			Pressures.		Revolutions per Minute.
	1	2	3	4	5	6	7	8	9	10				Inlet.	Outlet.	Atmosphere.	Inlet, Inches.	Outlet, Inches.	
	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.	oz.									
January 1	8½	6¾	5	3½	2½	1½	¾	¼	0	0	10 Gallons.	52,000	Nil.	77°	75°	38°	24	23	7½
,, 2	8¾	7	6	4½	3¼	2½	1½	½	¼	0	10 ,,	57,000	Nil.	73°	66°	32°	21¾	20¼	4
,, 3	9½	8	6	3¾	3	2½	1½	¾	¼	0	10 ,,	60,000	Nil.	75°	68°	40°	23½	22	4
,, 4	9½	7¾	5¼	4¼	3¼	2½	1¾	¾	¼	0	10 ,,	65,000	Nil.	74°	68°	33°	24	22¼	5
,, 5	9½	7	6	4	3	2½	1½	1	¼	0	10 ,,	34,000	Nil.	77°	65°	35°	14½	14	5
,, 6	9½	7½	6¼	4½	3	2½	1½	1	¼	0	10 ,,	63,000	Nil.	72°	66°	27°	24	22½	4½
,, 7	11	9	7	5½	3¾	3	1¾	1¼	¼	0	10 ,,	59,000	Nil.	74°	6 °	31°	25	23½	5
,, 8	9½	7½	6	4½	3	2	1	¾	¼	0	10 ,,	78,000	Nil.	73°	61°	31°	28	26¼	4¼
,, 9	11	9	7	5	3¾	2½	1¾	1	¼	0	10 ,,	82,000	Nil.	74°	67°	33°	27½	25½	5
,, 10	10¾	8½	6¾	5	3½	2½	1½	1	¼	0	10 ,,	66,000	Nil.	76°	64°	28°	28½	27	5
,, 11	12½	10	7¾	5¾	4¼	3¼	1¾	1¼	¼	0	10 ,,	61,000	Nil.	73°	64°	27°	26½	25¼	5
,, 12	11	8¾	6¾	—	—	—	1¼	¾	¼	0	10 ,,	39,000	Nil.	74°	64°	27°	26½	25¼	5
,, 13	13	10¾	8¼	6	4¾	3¼	2	1¼	¼	0	10 ,,	78,000	Nil.	73°	65°	42°	28	26	5

(Signed) JOHN CLARK, Engineer.

For further particulars and testimonials, address

Messrs. KIRKHAM & HERSEY, GAS ENGINEERS, 21, ABINGDON STREET, WESTMINSTER.

GEORGE BRAY & CO.,

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May be consulted on all matters connected with Valuations, Arbitrations, and Parliamentary Applications connected with Gas-Works. Having been engaged on extensive Arbitration Cases, which, combined with his experience in Construction and Contracting, his knowledge of Engineering and Valuations is both extensive and reliable.

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The above forms are registered.
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ALSO PATENTEES OF
COMPENSATING WET METERS;
INDICATORS,
STATION AND TEST METERS TO ORDER
STREET-LAMPS AND FITTINGS.
WORKS: WATERBEER ST., EXETER.

CADZOW COAL COMPANY,
LIMITED.
Cadzow Collieries, Hamilton (Lanarkshire).
Office: 161, Hope Street, Glasgow.

Report on the Cadzow Ell Coal.
By Dr. W. WALLACE, F.R.S.E., F.C.S., Gas Examiner for the City of Glasgow.

I have made a careful chemical analysis and practical assay of an average sample of the Ell Coal from Cadzow Colliery, received on the 5th inst., from Messrs. The Cadzow Coal Company, Hamilton, and have obtained the following results:—

Analysis.

Volatile matters	Gas, tar, &c.	34·03	46·12
	Sulphur	·04	
	Water, at 212° Fahr.	12·05	
Coke	Fixed carbon	52·90	53·88
	Sulphur	·03	
	Ash	·95	
			100·00

Coke (dry) per ton of Coal, 1205 lbs., or 10 cwts. 3 qrs. 1 lb

Analysis of the Coke (Dry).

Carbonaceous or combustible matter	98·18
Sulphur	·06
Ash	1·76
	100·00
Specific gravity of the coal	1·250
Weight of a cubic foot in pounds	77¾

Practical Results.

Gas per ton of coal at 60° F. and 30 in. bar.	10,122 cub. ft.
Illuminating power in standard sperm candles by Argand jet, consuming 5 cubic feet per hour	16·76 candles.
Value of one cubic foot of gas in grains of sperm	402
Equivalent of a ton of coal in pounds of sperm candles	581
Durability of one cubic foot of gas by 5-inch flame	42 min. 45 sec.
Gravity of the gas, air = 1000	448

Remarks.
The sample tested consisted of a complete section of the seam, 5 ft. 6 in. in thickness. The results show that this Coal is well adapted for the manufacture of gas and coke, both being for soft coal of very fine quality. Of the many hundreds of coal samples I have tested, I have not hitherto had one with so small a proportion of ash as the Cadzow Coal. WILLIAM WALLACE.
Chemical and Gas Laboratory,
138, Bath Street, Glasgow, March 15, 1878.

J. & H. ROBUS,
BUILDERS AND CONTRACTORS
FOR THE ERECTION AND REBUILDING OF GAS AND WATER WORKS,
RETORT-SETTING—A SPÉCIALITÉ.
ROBUS'S IMPROVED RETORT-SETTINGS, guaranteed to Carbonize a large amount of Coal with a small per cent. of Fuel.
ESTIMATES GIVEN FOR MAIN-LAYING.
N.B.—All kinds of Fire Goods and Gas Apparatus supplied on the shortest notice.
Address:—J. & H. ROBUS, BELL GREEN, CATFORD, LONDON, S.E.

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MARQUESS OF LONDONDERRY'S COLLIERIES,
COUNTY OF DURHAM.
For Prices and Particulars, apply to
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GAS ENGINEERS,
Gas-Meter, Gas Apparatus, and Gas-Fittings Manufacturers,
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Meter Works in London—2, CROSS STREET, WILDERNESS ROW, E.C.
STATION-METERS, GOVERNORS, CONSUMERS METERS, GAS LUSTRES, CHANDELIERS, BRACKETS, &c.,
And every description of Gas-Fittings and Gas Apparatus.

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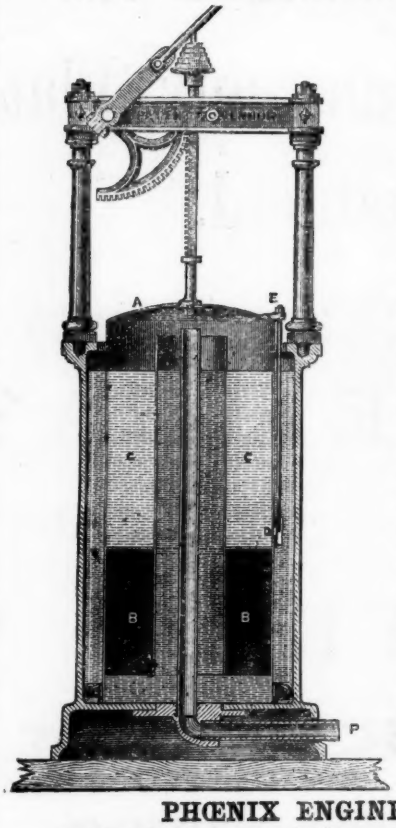
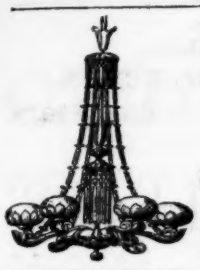
Patent Compensating Steam Governor,
WITH SELF-CONTAINED WATER-BALANCE.



DESCRIPTION OF THE APPARATUS.
The illustration represents a section of the Patent Governor. The lower part of the Bell A is fitted with a loose Float B, and in the upper part of the Bell is a deep annular Water Chamber C, at the bottom of which is an opening D, with a slide outside regulated by a Screw Spindle E, to allow the water to pass in and out of the Chamber C quickly or slowly, according to circumstances, but when once adjusted the slide does **not require altering.** This Self-compensating Chamber gives great steadiness to the up and down movement of the Bell and effectively prevents the "hunting" motion so common with other Governors, thereby ensuring a more perfect action on the throttle-valve of the Engine **than attained by any other.** The sketch shows the clip lever fixed to work on throttle-valve at an angle, and can work in either direction. P is the Gas Inlet-pipe to Governor.

G. W. & Co. also make **special Steam Throttle Valves,** suitable for working with this Governor, and alter existing Throttle Valves to same plan.

PHŒNIX ENGINEERING WORKS,
Holland Street and Bear Gardens, Southwark, S.E.



F. & C. OSLER,

45, OXFORD STREET, LONDON, W.

MANUFACTORY AND SHOW-ROOMS:

BROAD STREET, BIRMINGHAM.

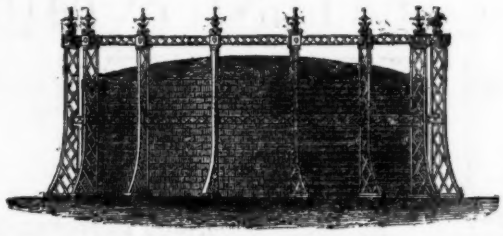
ESTABLISHED 1807.

MANUFACTURERS OF CRYSTAL GLASS CHANDELIERS.

WALL LIGHTS, AND LUSTRES FOR GAS AND CANDLES.

TABLE GLASS OF ALL KINDS.

CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.



THE HORSELEY COMPANY,

LIMITED,

TIPTON, STAFFORDSHIRE.

LONDON OFFICE:

WESTMINSTER CHAMBERS, VICTORIA STREET,

GAS ENGINEERS, IRONFOUNDERS, &c.,

MANUFACTURERS OF

GASHOLDERS, WROUGHT AND CAST IRON TANKS, CONDENSERS, PURIFIERS, SCRUBBERS, MAINS, RETORT-LIDS, PLAIN AND DISHED LAMP-POSTS, PIPES,

AND ALL REQUISITES FOR EITHER

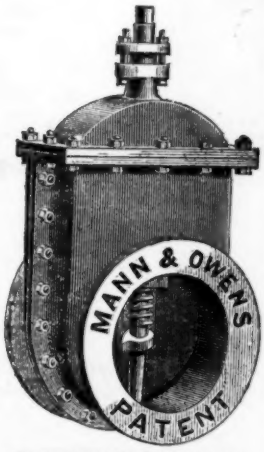
GAS OR WATER WORKS;

ALSO

MAKERS OF ROOFS, BRIDGES, &c.

MANN & OWENS' PATENT GAS-VALVE.

EVERY VALVE WARRANTED TO BE PERFECTLY SOUND AND GAS-TIGHT.



VALVE, with Indicator or Above Ground. UNDERGROUND VALVE.

The advantages of this Patent Valve over all others yet introduced are, that it is always as tight as the best wedge or spring valve, without the possibility of setting fast or becoming suddenly leaky. The surfaces not being in contact during the operation of opening or closing, leakage through wear and tear is avoided.

The Gas Engineer will not fail to see the importance of such a valve in connexion with his purifying apparatus, particularly in the case of large sizes.

The slide being operated either by a screw and nut, or by a pinion and rack, a cam bearing upon a plane, cast on the back of the Valve, forces it against the face, and renders the escape of gas an impossibility. By a slight turn of the pinion or screw, the slide is released, and brought away from the face, by which means friction is avoided, and the only force required to open the Valve is that due to its own weight.

SOLE MANUFACTURERS:

S. OWENS AND CO.,

HYDRAULIC AND GENERAL ENGINEERS,

WHITEFRIARS STREET, LONDON, E.C.

PRICES, SIZES, AND FULL PARTICULARS ON APPLICATION.

YEO'S PATENT ENGINE PACKING,

Price 1s. 8d. per lb., any size.

Tarred & White Spun Yarn for Pipe Joints, at various prices.

Samples and testimonials free per post.

E. YEO, NEWTON ABBOT.

T. NEWBIGGING,

CONSULTING GAS ENGINEER,

5, NORFOLK STREET, MANCHESTER.

THOMAS CARR & SON,

MANUFACTURERS OF

FIRE-BRICKS, LUMPS, TILES, RETORTS, &c.,

COTSWOOD FIRE-BRICK WORKS, SCOTSWOOD-ON-TYNE.

Also Makers of all kinds of Common Building Bricks, and of Pressed White and Red Bricks for Facing.

BOUCK & CO., LIMITED,

TAR DISTILLERS & MANUFACTURING CHEMISTS,

MILES PLATTING, MANCHESTER.

BRANCH WORKS, BLACKBURN.

BUYERS OF COAL TAR,

And Crude Products therefrom,

AMMONIACAL LIQUOR, &c.

BIRTLEY IRON WORKS,

CHESTER-LE-STREET, DURHAM.

Manufactory for every description of Casting and Machinery for Gas-Works and Water-Works.

Warehouse in London for Cast-Iron Pipes and Connexions of all sizes and in any quantity, Scott's Wharf, Bankside, Southwark.

Agent in London, Mr. J. HAWARDEN, 101 Cannon Street, E.C.

JAMES OAKES & CO.,

ALFRETON IRON-WORKS, DERBYSHIRE,

AND

WENLOCK IRON WHARF, 21 & 22, WHARF ROAD, CITY ROAD, LONDON, N.,

Keep in London and at their works large stocks of PIPES and CONNEXIONS (1½ to 36 inches in diameter); also make and supply Retorts, Tanks, Columns, Girders, Special Castings required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.

CHARLES HORSLEY, Agent.

THE

SILICA FIRE-BRICK CO.,

OUGHTIBRIDGE

Near SHEFFIELD,

Manufacturers of THE ORIGINAL SILICA OR DINAS FIRE-BRICKS. Specially adapted for Gas-Retort Furnaces and for Siemens's Gas-Furnaces. Shipments promptly executed to London, Liverpool, Hull, Grimsby, &c.

TROTTER, HAINES, & CORBETT,

BRETTELL'S ESTATE

FIRE CLAY & BRICK WORKS,

STOURBRIDGE.

Manufacturers of GAS-RETORTS, GLASS-HOUSE FURNACE & BLAST-FURNACE BRICKS LUMPS, TILES, and every description of FIRE-BRICK.

Proprietors of

BEST GLASS-HOUSE POT and CRUCIBLE CLAYS.

Successors to

E. BAKER AND CO., LATE BRIERLEY HILL, STAFFORDSHIRE.

HARPER & MOORES,

PROPRIETORS OF THE

BEST STOURBRIDGE CLAYS,

STOURBRIDGE.

Manufacturers of all Descriptions of

BEST STOURBRIDGE FIRE-BRICKS, LUMPS AND CLAY RETORTS

Of all Dimensions for Gas-Works,

GLASS-HOUSE POTS & CRUCIBLES

ESTABLISHED 1836.

The Highest Award was obtained by H. & M., at the Philadelphia Exhibition, 1876, for Superior Quality of Manufacture. SILVER MEDAL, PARIS, 1878.

GAS AND WATER PIPES.

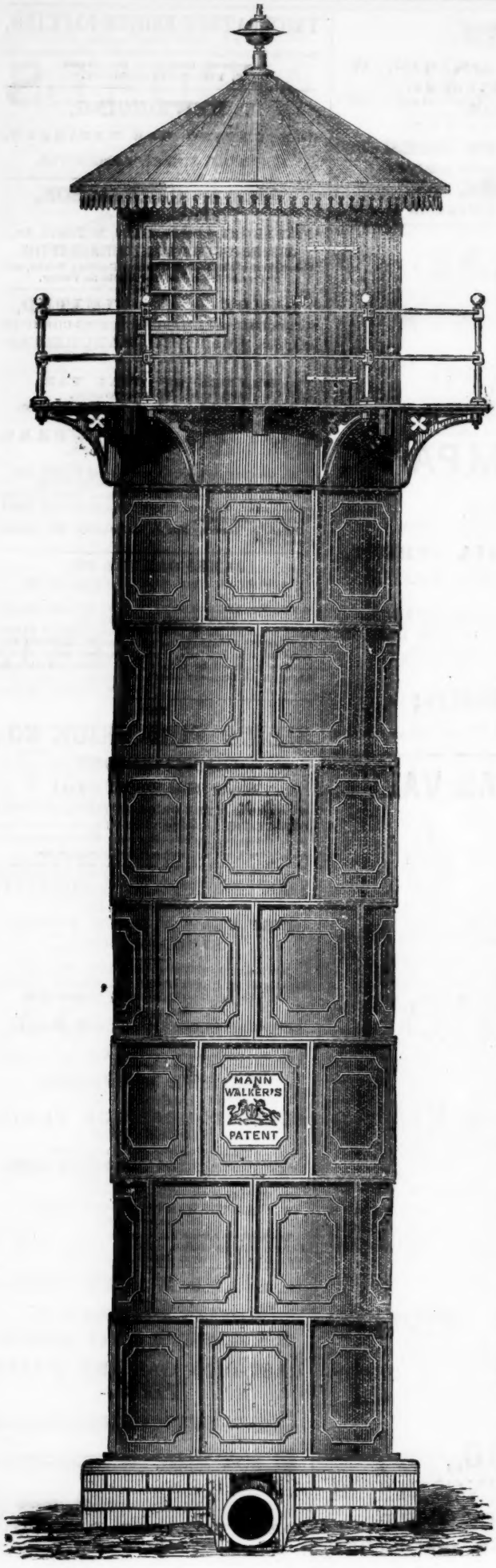
WILLIAM MACLEOD & CO.,

23 & 25, OSWALD STREET, GLASGOW.

CAST-IRON GAS AND WATER PIPES.

DELIVERY F.O.B., GLASGOW

Prices on application.



C. & W. WALKER,
8, FINSBURY CIRCUS,
LONDON, E.C.

MANN & WALKERS' PATENT SCRUBBER.

By Letters Patent in Great Britain, Europe, and the United States of America.

By some important improvements recently patented, the purifying power of these Scrubbers has been much increased, and a stronger ammoniacal solution obtained, which is found to absorb a large portion of the carbonic acid contained in gas, effecting an important saving in money and labour in the lime purifiers, and where oxide only is used, the increase in the illuminating power of the gas obtained by these Scrubbers is shown in a remarkable degree, in consequence of the large quantity of carbonic acid removed from the gas.

It is to be particularly noted that the important results of these Scrubbers do not depend upon the machinery alone. The entire internal construction of the Scrubber bears an almost equally important part. For this reason, where it is desirable to convert existing Scrubbers, whose dimensions happen to be suitable, the work commences by ripping out the whole of the interior of the shell, and beginning the internal construction *de novo* from bottom to top.

Fifty million cubic feet of gas per 24 hours are purified from ammonia by these Patent Scrubbers in a winter's day in the gas-works of London, where the purity of gas supply is the highest in the world, under the chemical restrictions of the Board of Trade.

Generally, wherever a high standard of purification is maintained in the chief cities and towns of the British Provinces and of Europe, these Scrubbers have become established.

By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade, relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals, generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

They contain their own engine power, requiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

Applications relating to dimensions and prices should be addressed to us, C. AND W. WALKER, 8, FINSBURY CIRCUS, LONDON, E.C., or to Mr. WILLIAM MANN, late Superintendent of the Chartered Gas-Works, BLACKFRIARS, LONDON; they should state approximately the largest make of gas in 24 hours on a winter's day, and the smallest make on a summer's day, to be purified.

THE

ONLY TWO GOLD MEDALS

FOR

GAS-BURNERS & GAS-METERS,

BRITISH SECTION,

PARIS EXHIBITION,

1878.

The International Juries of the Paris Exhibition have awarded to

WILLIAM SUGG,

GAS ENGINEER,

VINCENT WORKS, VINCENT STREET,

WESTMINSTER, S.W.,

ONE GOLD MEDAL, Class 27,

FOR HIS

PATENT GAS-BURNERS, PATENT LAMP-GOVERNORS,

AND

PATENT CONSUMERS DRY GOVERNORS;

AND ALSO

ONE GOLD MEDAL, Class 53,

FOR HIS

PATENT ILLUMINATING POWER METERS,

IMPROVED JET-PHOTOMETERS, PHOTOMETER METERS,

AND

IMPROVED COMPENSATING WET METERS

WITH

SIMPLE INDEX.

Prices and Particulars on application to

WILLIAM SUGG,

GAS ENGINEER, VINCENT WORKS, WESTMINSTER

ROBERT MARSHALL,

CANNEL COAL MERCHANT,

198, ST. VINCENT STREET, GLASGOW.

SHOTT'S BOGHEAD.

HARTHILL CANNEL

Yields 14,920 cubic feet of 40·92-candle gas per ton.

THRASHBUSH CANNEL

12,530 cubic feet of 40·92-candle gas per ton, and 9 cwts. of good coke.

LOTHIAN'S CANNEL

Yields 12,500 cubic feet of 34-candle gas per ton, and 9 cwts. of excellent coke, containing only 4 per cent. of ash.

MUIRKIRK, No. 1, CANNEL

Yields 12,160 cubic feet of 32·5-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash. This cannel is almost free from sulphur.

OLD WEMYSS CANNEL

Yields 13,320 cubic feet of 32·5-candle gas per ton.

Prices and full analyses on application at above address, or from WEDDERSPOON, FERGUSSON AND CO., 21, Lime Street, LONDON, E.C.

GAS COAL.

POPE & PEARSON, LIMITED, have now the authority of several of the most eminent Gas Engineers of London in stating that their Coal yields *in practical working over* 10,000 *cubic feet of gas, with an illuminating power of* 16 *candles;* or by the standard burners now used by the London Gas Companies, an illuminating power equal to 17½ candles.

One ton yields 12½ cwt. of good coke. This Coal can be shipped from Hull, Goole, Liverpool, Morecambe, and Barrow.

For further particulars, apply to POPE AND PEARSON, LIMITED, West Riding and Silkstone Collieries, near LEEDS.

HEBBURN MAIN GAS COALS.

T. Stone, Esq., of Weymouth, writes on Nov. 17, 1876: "I have used about 12,000 tons of this Coal, with, I think, the best possible results, although not always under the most favourable circumstances. My Coal account made up to Midsummer last showed a makeage of 10,524 cubic feet per ton of 14½-candle gas, and not a hundredweight of Cannel used. This statement would, I know, be incredible to many men, and may provoke the remark, 'How much of it is paid for?' For the gratification of such, I have to say that, of the above quantity, 9866 cubic feet per ton of Coal carbonized were brought to charge and duly paid for, with the exception of about 6s. per cent. for bad debts. The coke is of excellent quality. The above facts I hold to be a greater recommendation to your Coal than any words of mine could be."

PRICES ON APPLICATION, EITHER F.O.B. OR BY RAIL IN TRUCK LOADS.

THE TYNE COAL COMPANY, LIMITED, OWNERS.
W. RICHARDSON, Fitter,
29, QUAYSIDE, NEWCASTLE-ON-TYNE.

HOLMSIDE GAS COALS.

South Metropolitan Gaslight and Coke Company,
589, Old Kent Road, London, S.E.,
Oct. 9, 1873.

At the request of Mr. Hedley, the owner of the Holmside Colliery, I have much pleasure in stating that, for about ten or twelve years past, this Company has taken at least half of its supply of Newcastle Coal from him. I can, therefore, confidently bear testimony to the good quality of the Holmside Coals, and consider they are equal to the best of the Newcastle Coals, in proof of which I may state that this year we are using those Coals exclusively, that the yield of Gas is from 9700 to 9800 feet per ton, and that the quality of the Gas, without any admixture of Cannel, is over 16 candles, as tested by the officer appointed by the Metropolitan Board of Works, using the London Gas Referees test.

The Coke is of excellent quality, and in quantity amounts to about 40 bushels from a ton of Coal.

The annual consumption of Coal amounts to about 75,000 tons.

GEORGE LIVESEY, Engineer and Secretary.

P.S.—I am at this date, Feb. 15, 1875, still using Holmside Coals as largely as ever, and am quite as well pleased with them as when I gave the above certificate.

GEORGE LIVESEY.

We are this year, 1878, using 80,000 tons of Holmside Coal. GEORGE LIVESEY.

FITTING OFFICE:
Address, 75, QUAYSIDE, NEWCASTLE-ON-TYNE.

M. BREMOND'S NAPHTHALINE PROCESS.

All negotiations respecting M. Brémond's patented process for preventing Deposits of

NAPHTHALINE

in Gas Main and Service Pipes should be addressed to Mr. W. H. BENNETT, 22, Great George Street, WESTMINSTER, S.W., or to M. BREMOND, Gas Engineer, Compania Madrilena de Alumbrado y Calefaccion por Gas, MADRID, who may be consulted upon all matters connected with the Gas Industry.

FERRAND DAVIES,

148 GRESHAM HOUSE, OLD BROAD STREET, LONDON, E.C.,
AGENT FOR
THOMAS BARR'S LESMAHAGOW MAIN CANNEL,
AND
NEWTON, CHAMBERS, & CO.'S SILKSTONE GAS COALS.

Analyses and Quotations on application.

WILSON CARTER AND PEARSON,
GAS COAL AND CANNEL FACTORS,

Supply to any Railway Station or for Export all kinds of Fuel for Gas purposes.

Address—CHIEF OFFICES:
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GEORGE ANDERSON,

GAS AND CONSULTING ENGINEER,

35A, GREAT GEORGE STREET,

WESTMINSTER, S.W.,

PATENTEE and MANUFACTURER of the following Invention

RETORT SETTINGS—giving great Economy of Fuel.

STEAM-ENGINES and EXHAUSTERS, FOUR-WAY VALVES, WASHERS, SCRUBBERS.

FUEL-MACHINE, for Compressing Breeze and Tar.

N.B.—Pamphlet, with Eighteen Illustrations and Letterpress on the Construction of Gas-Works, post free, 2s. 6d.

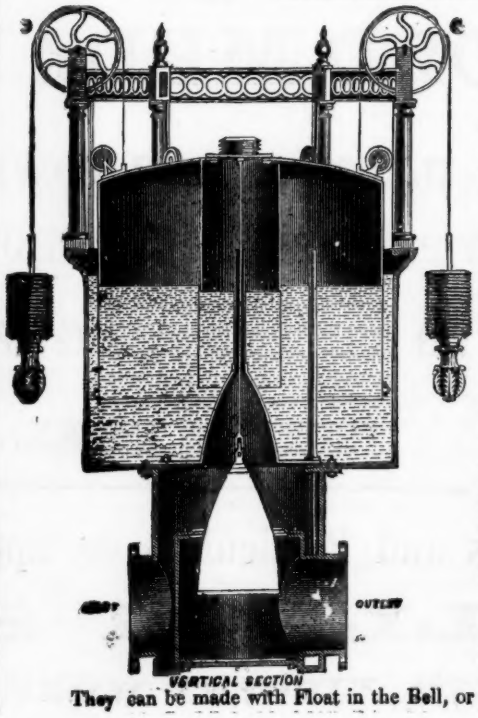
PRICES AND ALL PARTICULARS TO BE HAD OF THE PATENTEE,
35a, GREAT GEORGE STREET, WESTMINSTER, S.W.

J. & J. BRADDOCK,
GLOBE METER-WORKS,
OLDHAM,

Beg to submit to Gas Engineers their

PATENT COMPENSATING GAS GOVERNOR,

Which is designed to give an uniform pressure at the Outlet to the Main at all draughts up to the full quantities which the Governors are made to control, such outlet pressure being less than the initial pressure.



VERTICAL SECTION

The uniformity of pressure is obtained by introducing a compensating chamber into the Bell or Holder of the Governor, which compensator is of the same area as the valve, both of which are operated on by the initial pressure, thereby placing the valve in equilibrium, no matter what the initial pressure may be. The action on the Bell is by the Gas passing along a pipe from the outlet, and the pressure is regulated by weights in connexion with the Bell as required.

From the sectional elevation attached hereto, it will be seen that only the Gas required to operate the Bell comes in contact with the water of the tank, which water will remain comparatively sweet and free from odour. That in case of accident to the Bell, no more Gas can escape than would pass up the pipe covering the valve-rod and Bell supply-pipe.

These Governors have been made and sent out of various sizes for from 2 to 24-inch Mains, and give most satisfactory results.

They can be made with Float in the Bell, or counterpoise as per section.

THE SILKSTONE & DODWORTH COAL & IRON COMPANY, LIMITED,

DODWORTH, BARNSLEY.

BENJAMIN WHITWORTH, Esq., M.P. . . . . Chairman.
Mr. RICHARD HARTLEY . . . . . Managing Director.

REAL OLD SILKSTONE GAS COAL.

JAMES PATERSON Esq., Gas Engineer, of the Warrington Gas Company, reported, Aug. 10, 1875:—

"This Coal possesses remarkable qualities as a gas and coking coal, and appears SECOND TO NONE IN THE KINGDOM. It contains the large quantity of 699 lbs. of illuminating matter, and 1498 lbs. of coke to the ton, and produces **12,240** cubic feet of 16·66 candle gas."

The above Company are raising nearly a thousand tons of the Real Old Silkstone Gas Coal per working day.

PRICES QUOTED TO ANY RAILWAY STATION, OR F.O.B. HULL, GRIMSBY, GOOLE, KEADBY, LIVERPOOL, AND FLEETWOOD.

SULPHATE AMMONIA.

R. W. WALLACE & CO.,

60, MARK LANE, LONDON, E.C.,

Are Buyers of SULPHATE AMMONIA in Large or Small Quantities, or Sell on Commission for Gas Companies and Makers.

PLANT ERECTED ON THE LATEST AND MOST APPROVED PRINCIPLE.

AGENTS to THE GASLIGHT AND COKE COMPANY, LONDON, for the SALE of SULPHATE AMMONIA. Works: BECKTON.

PARIS EXHIBITION,
1878.

THREE MEDALS
AND
HONOURABLE MENTION
HAVE BEEN AWARDED TO
JOSEPH CLIFF & SONS
For their Various Exhibits, amongst which is a
SILVER MEDAL
FOR THEIR
PATENT MACHINE-MADE
RETORTS AND FIRE-BRICKS,
Being the Highest Honour given for this class.

Established

1795.

JOSEPH CLIFF & SONS,

THE ORIGINAL
WORTLEY FIRE-BRICK WORKS,
NEAR LEEDS,
London Wharf: No. 4, inside Great Northern Goods Station, King's Cross, N. Liverpool: Leeds Street.

SPECIAL NOTICE.—Our Patent Machine-Made Retorts have now been thoroughly tested, and have proved themselves infinitely superior to those made by hand. At several large works it has been settled, beyond question, that, owing to the compactness and general excellence, more gas is sent to the gasholder from each ton of coal carbonized than is the case with hand-made Retorts.

NEWTON, CHAMBERS, & CO.,

THORNCLIFFE IRON-WORKS AND COLLIERIES,
NEAR SHEFFIELD.

CELEBRATED SILKSTONE GAS COALS.

The various descriptions of Gas Coal produced from the above Collieries possess an unequalled reputation, combining in a large degree the constituents essential for the production of the best quality of Coke and Gas of a high illuminating power.

A recent extensive development of the Collieries enables us to offer increased supplies.

JAS. PATERSON, Esq., of Warrington, after testing various qualities of our Coal, has sent the following testimony of their merits:—

"Warrington Gaslight and Coke Company,
Offices, Mersey Street, Warrington, April 23, 1877.

"MESSRS. NEWTON, CHAMBERS, AND CO.,

"GENTLEMEN,—After carefully testing the various samples of Gas Coals sent from your Collieries for analysis, I have pleasure in reporting them as belonging to the highest class of Gas and Coking Coals.

"The average of Nine samples gives a yield of **12,500** cubic feet of **15½**-Candle Gas, being equivalent to **664** lbs. of sperm per ton, and **1420** lbs. of fixed carbon of a very superior quality. All the samples bear a close relation to each other in value.

"Yours truly, "JAMES PATERSON."

Full particulars will be sent on application to us—address as above.

NEW PATENT WET GAS-METER,

THE "RELIANCE,"

MANUFACTURED BY THE

GAS-METER COMPANY, LIMITED

238, KINGSLAND ROAD, LONDON; UNION STREET, OLDHAM; HANOVER STREET, DUBLIN.

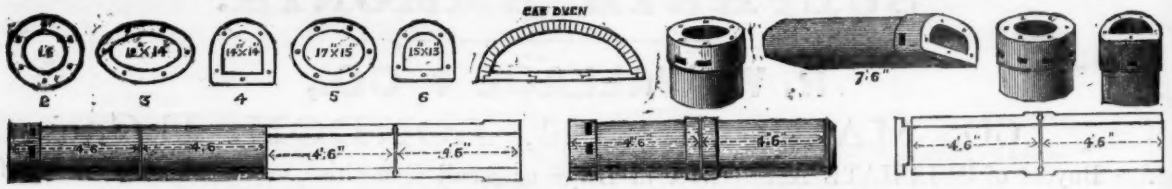
The object attained by this invention is the *correct measurement of Gas under every fluctuation of the pressure.*

Accuracy is obtained by subjecting the whole of the water which determines the measuring chambers of the drum to one uniform even pressure, and so prevents unequal displacements of the water-line.

The "RELIANCE" METER has been tested by several of the most experienced official meter inspectors. Copies of their reports may be obtained on application to the

GAS-METER COMPANY, LIMITED,

238, KINGSLAND ROAD, LONDON.



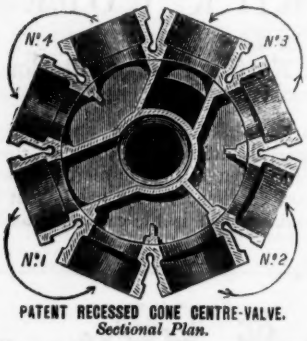
HARRIS & PEARSON, STOURBRIDGE,

Proprietors of Best Clay Mines. Largest makers in the World of Gas-Retorts, Lumps, Tiles, Fire-Bricks, and Fire-Clay Goods of all kinds. 200,000 feet of Gas-Retorts of all Sizes and Patterns in Stock, all in good order. Orders for any Size executed on receipt.

CAST-IRON GAS AND WATER PIPES,

WROUGHT IRON AND LEAD TUBING, GLAZED DRAIN-PIPES,

STAFFORDSHIRE BLUE BRICKS.



PATENT RECESSED CONE CENTRE-VALVE.
Sectional Plan.

R. LAIDLAW AND SON,

EDINBURGH AND GLASGOW,

SOLE MAKERS OF

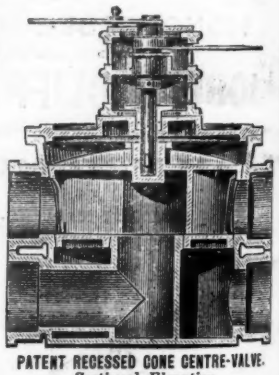
PATENT

RECESSED CONE CENTRE-VALVES,

Constructed on the principle of the ordinary Plug-Cock.

THROUGH-WAY & FOUR-WAY COCKS

Of all descriptions.



PATENT RECESSED CONE CENTRE-VALVE.
Sectional Elevation.

London Office: 6, LITTLE BUSH LANE, CANNON STREET.

D. HULETT & CO.

Invite the attention of Gas Companies, Corporations, and others to their

PATENT STREET LAMPS,

Which are so constructed that neither putty nor other materials are required to secure the glass. No hacking out of old putty, which frequently destroys the frames. A new pane of glass can be inserted in two or three minutes by any inexperienced person, the glass being secured by a hinged flap and turn button.

PRICE 10s. each, net. Special quotations for large quantities.
Also made EXTRA STOUT recommended for its durability, PRICE 11s. 6d. each.

D. HULETT'S IMPROVED SERVICE CLEANSER,

By the use of which stoppages in service and other pipes are freed from naphthaline and other obstructions in a few minutes. PRICE 73s. net.

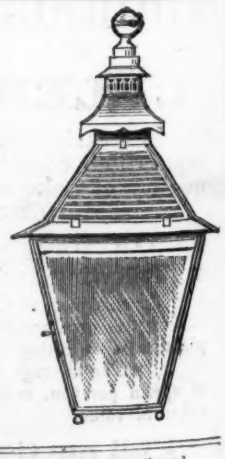
HULETT'S PATENT MERCURIAL REGULATOR,

For inserting in mains, to prevent the excess of pressure in high ground, or other elevated positions.

PATENTEES OF IMPROVED WET AND DRY GAS-METERS.

Makers of all kinds of Pressure-Gauges, Gaseliers, and every kind of Gas-Fittings for the Trade.

GAS HEATING AND COOKING STOVES.



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